CHAPTER – V

GRAPE MARKETING IN NASIK DISTRICT, EXPORT OF GRAPES IN SELECTED AREAS

5.1 INTRODUCTION

The grape area in Nasik District is a naturally developed due to the agro-climatic conditions and easy availability of related inputs. The water availability from five rivers, the dams and the flowing canals had earlier induced the farmers to go for sugarcane crop. The establishment of sugar factories and related infrastructure in this area made the cultivation of sugarcane easy with assured sale proceeds. But the progressive farmers of Nasik were not satisfied with the income from sugarcane crop, which was a heavy water consuming one. At the same time area under chilly and turmeric was also reduced and the high yielding varieties of grapes made an attractive proposition. The Nasik farmers developed the expertise in producing quality grapes. The grapes from Nasik thus offered premium price in domestic and international markets. Nasik is also well connected by national highways leading to Northern and Southern Indian markets. Thus the favourable agro-climatic conditions, good infrastructure and nearness to the Mumbai market promoted the grape-growing for this area.

Before industrialization, the Nasik area was mainly depending on the Agricultural activities as a source of income. Grape cultivation was introduced here as early as in the 14th century but it was restricted to areas around Nasik town only. The expansion of grape coverage was slow due to limited market in India mostly confined to the elite group of people. After introduction of seedless varieties somewhere in
1960 the growth of grape farming industry took a long stride. The progressive farmers joined hands with some devoted scientists and horticulturists and popularized the varieties locally suitable and took the knowledge to the smallest of the farmers. The availability of water, well drained rich soils, pollution free atmosphere, the cool climate, availability of labour and the entrepreneurship bent of the farmers were the main factors responsible for the development of this area.

After fulfilling the domestic market, the growers tapped the international market through the Grape Growers Association. The growers association and “Mahagrapes”, an organization created by the farmers especially for export of grapes, developed the pre-cooling technology and introduced the Indian Seedless grapes in London Super Market. The England Super markets since then have been a favourite export destination as the former import large quantities of fruits and markets them through their huge networks of 300-500 retail outlets throughout Europe. The export of grapes from Maharashtra has been on an increasing trend since the year 1990 and today it has reached to 32000 MT earning a foreign exchange of Rs 90 crores.

5.1.2 Evolution of Grape Cultivation

The grape area in Nasik District is a naturally developed cluster due to the agro-climatic conditions and easy availability of related inputs. The water availability from five rivers, the dams and the flowing canals had earlier induced the farmers to go for sugarcane crop. The establishment of sugar factories and related infrastructure in this area made the cultivation of sugarcane easy with assured sale proceeds. But the progressive farmers of Nasik were not satisfied with the income from sugarcane crop, which was a heavy water consuming one. At the same time area under chilly and turmeric was also reduced and the high yielding varieties of grapes made an attractive proposition. The Nasik farmers developed the expertise in producing quality grapes. The grapes from Nasik thus offered premium price in domestic and international markets. Nasik is also well connected by national highways leading to Northern and Southern Indian markets. Thus the favourable agro climatic conditions, good
infrastructure and nearness to the Mumbai market promoted the grape-growth in this area.

The Grape farming in the Nasik district is not dominated by any particular community or caste, and people of all economic strata and education level have picked up the expertise in this field. Initially, due to high cost of investment and risk, only big farmers would enter into this business while the small ones and the landless labourers would work only on daily wages. However, with subsequent generations more and more small farmers and labourers have purchased new fallow lands and have developed it with financial assistance from banks. The eagerness to acquire more and more knowledge about the Indian Grape markets and the zeal to experiment brought these people closer and has bonded them together.

5.1.3 Current trends in grape marketing of Nasik grapes.

Nasik, the hub of grape cultivation in the country, recorded 13.77 % rise in the fruit's exports in 2006-07 at 19,000 tonnes compared with last year's 16,700 tonnes. The exports, which were worth Rs 95 crore in the previous fiscal, have seen a six-fold growth in the last five years from 3,775 tonnes in 2001-02. Nasik district contributes almost 75% of the total grape exports from Maharashtra and 55% to the country's total exports.

According to Dhananjay Wardekar an officer in the Maharashtra State Agriculture Department, 19,000 tonnes of grapes were exported to the UK, the Netherlands, Germany, Ireland, Poland, Russia, Belgium, Dubai, Singapore, Hong Kong, Norway and Taiwan, in 2006-07.

The total area under grape cultivation in the district increased by 5,000 acres to 35,000 hectares in 2006-07, with the area under wine grape varieties doubling during the period. The total investment in the district's vineyards was estimated at Rs 2,625 crore.
"There are about 131 grape exporting companies in Nasik. In 2006-07, there were about 11,938 grape growers, who had registered for exports. Phyto-sanitary certificates, which are mandatory for grape exports according to the Apeda guidelines, were given to 1,500 exporters," Wardekar added. Freshcrop Fruits, a local company, exported the highest in the district at 1,270.53 tonnes followed by Mahindra Shulabh (708 tonnes), ND Grapes (672.77 tonnes), Fieldfresh Foods (623.88 tonnes) and Indyaglobal Venture (617.66 tonnes)

Nasik, the grape capital of India, has recorded 45.52 per cent rise in export of grapes in FY08 (December-April season) compared with last year, earning foreign exchange worth Rs 174.20 crore. In the last six years, grape export from the district has risen over seven-fold, from 3,775.37 metric tonnes (mt) in FY02 to 27,650 mt in FY08. Nasik accounts for 55 per cent of total exports of the commodity from the country and 75 per cent of Maharashtra.

Export of grapes, mainly from the state, suffered a loss of Rs 250 crore after the European Union countries refused to accept the consignments due to chemical residue in 2009-10. The rejected grapes were later accepted by a few other countries at an extremely low price. Grape exporters from Maharashtra, especially from Nasik, Pune and Sangli, which are major grape growing and exporting districts in the state suffered the losses.

The European Union countries revised their import norms for chemical residue in grapes in December last year, which were not communicated to grape exporters, who came to know about the changed norms only when their containers were stopped at various ports in Europe.

Jagannath Khapare, chairman of Grape Exporters Association (GEA), said, "The state exported 46,628.46 tonnes of grapes in 3,750 containers. The first 700 to 800 containers were accepted by the UK and Russia and received better prices. The
remaining grapes were sold at an average price of four euro per kilo. The importers chose to sell grapes at such lower prices to control the damage."

Major importers of grapes, like The Netherlands and Germany, had refused to accept the fruit after the chemical was detected.

Khapare said, "A proposal demanding compensation to cover the Rs 250 crore loss has been sent to the state as well as the Union government. Besides Maharashtra, Karnataka and Andhra Pradesh also grow and export grapes. Since the volume of these states are small, Maharashtra had to raise the issue with the Union government."

Union agriculture minister Sharad Pawar also belongs to the state and is well aware of the situation. The exporters will also strongly push the matter in Delhi, he added.

The rejected grapes had a residue of chlormequat chloride (CCC), a growth hormone being used for many years by grape growers in India. "The CCC is not a banned growth hormone and hence the containers should not have barred from entering the market," Khapare said. He pointed out that as per the new norms, 0.05 milligram per kilogram is the new permissible residue level for farmers exporting to EU countries as against the earlier limit of 1.6 mg per kg.

The grape capital of India, is Nasik district has recorded a fall of 58% in export of grapes in FY 2010-11 (December –April season) as compared to that of last year due to unseasonal rains that had hit the vineyards during November 2010, causing production losses from 30% to 70% in vineyards in Nasik district, earning foreign currency amounting to Rs. 100 crores.

Nasik district is known for producing large quantity of grapes as it shares 55% of total export of grapes from the country and 75% of total export of grapes from the state.
The number of grapes exporting firms this season was around 106. Around 12,888 vineyards, each admeasuring from 0.40 hectare, were registered in 2010-11 season by the Office of the District Agriculture Superintendent, for export of grapes. Around 1,204 Phyto sanitary certificates, which are compulsory for grape exporters as per guidelines of APEDA, had been given to these exports.

Some of the exporters who have registered their produce with the state-owned Export Credit Guarantee Corporation of India Ltd are likely to get 90 per cent of the value of their declared produce with the corporation. According to the officials, a farmer or exporter has to pay the premium and register the produce with the corporation before export.

After the grape crisis, the corporation is gathering information on the total number of registrations and their value, said the official. For Reprint Rights: timescontent.com

Despite losses incurred by grape growers of Maharashtra in 2009, when their produce was rejected by the European Union (EU) countries on the complaint of excess chemical residue of growth hormone in the fruit, registration of grape farms for export has gone up from 14,790 farms in 2009 to 15,686 in 2010.

Nasik district which is the largest grape-growing district in India has accounted for the highest number of registrations.

Speaking to TOI, Govind Hande, the inspecting authority for phytosanitary certification, said, "The EU countries have updated their list of recommended and banned chemicals in the growing of grapes. The state horticulture department conducted awareness programmes in grape-growing districts mainly Nasik, Sangli, Latur, Solapur, Ahmednagar and Pune and circulated this information among farmers, along with a rough time-table of when they need to be ready with the fruit for export. The list of recommended chemicals has been revised from 99 to 171 chemicals this year."
He said, "The interesting is part is that this year it was being expected that due to the losses in 2009, less number of grape farmers would register for export. But the opposite happened. Also, the state has assured grape growers of support."

It may be noted that phyto-sanitary certification is mandatory for grape export to EU countries. This certificate ensures that only recommended fertilizers and pesticides are used by farmers. Also, that the residue level of chemicals is within importing countries' recommended limits.

Hande said that at present, farmers are preparing their produce for export. They have started to prune the grape plant and trim the grape bunch as part of their activities. "Harvesting will begin by the first week of January and export containers will leave from Indian ports from the first week of February. Exports will continue for the next two months."

"In Maharashtra, out of 15,686 farm registrations for export, Nasik district accounts for 12,923. Sangli and Pune are the other two major grape-producing districts, followed by Ahmednagar, Satara, Latur, Solapur and Osmanabad," Hande said.

The registration of farms for export is done via grapenet, which is an online network developed for grape growers and exporters. Every farm gets a bar-code, which helps trace the journey of the produce from the farm to the customer's table.

However, Hande said, some of the registered farms were hit by post-monsoon rains in November 2010. "The grapes in some other farms were affected by the downy mildew disease. Hence, the grape production will be lower than the potential of the farms. Hopefully, despite this, with registration of 15,686 farms, grape export would reach the 40,000 tonne mark like in 2009." A large quantity of Indian grapes, mainly those from Maharashtra, could not enter the EU market in 2009 since the importers refused to accept the produce on grounds of excess residue of growth hormone, he added.
Currently, about 10,905 hectare area in the state is under grape cultivation for export. In 2009, 10,500 hectare area was registered with grape net. Though Karnataka and Andhra Pradesh also grow grapes, their production is nowhere close to Maharashtra's, whose share is 95 per cent of the country's export.

5.1.4 New emerging areas in Nasik district

Pimpalgaon is gradually acquiring the reputation of being the Mecca of grape growing. The cash earnings in the grape season have started attracting more and more farmers towards this profession. The business of growing grape saplings is also being taken up by a lot of farmers.

Mr. Rajendra Narayan Vidhate is one of the chief innovators in the field of grape saplings. He has been experimenting on new varieties for the last seven years and has gained the confidence of the local farmers. Sharad Seedless and Thompson Seedless are two varieties on which he has experimented. The future earnings of the farmers depend on the type of saplings they select. It has now been noticed that barring a few good nurseries the farmers are being cheated by many sellers. The farmers also have to cater for losses due to weather, plant diseases and poor soil conditions. However if the farmers take adequate efforts in spite of all these factors they can earn a good income. Nasik district has acquired a reputation of having some of the best saplings. They are being sent to different parts of Madhya Pradesh, Karnataka and Andhra Pradesh from Nasik.

5.2 Variety of grapes grown in Nasik district

There are various varieties of grapes grown in Nasik district. They are

1. Thompson Seedless
2. Sharad Seedless
3. Manik Chaman
4. Black Sonaka
5. Sonaka
6. Tas-e-ganesh
7. Jumbo Seedless
Total Geographical Area of Nasik District is 15,63,042 Ha out of which 8,65,000 Ha is under Grapes cultivation. Soil characteristics: Nasik has Medium Deep Black type of Soil, pH 7-9, EC (mmhos per cm) 0.3-4.0, Exchangeable Sodium Percentage (ESP)12-48 ,Organic Carbon % 0.4-12 , EC (me/100g) 20.0-48.0

Table 5.1 Varieties of grapes and their description

<table>
<thead>
<tr>
<th>Name of the variety</th>
<th>Description</th>
<th>Berry diameter</th>
</tr>
</thead>
<tbody>
<tr>
<td>Thompson Seedless</td>
<td>Berries are oval to oblong in shape with T.S.S. 18-22(^0) Brix, acidity 0.5% to 0.7%</td>
<td>16 mm to 18 mm</td>
</tr>
<tr>
<td>Sonaka</td>
<td>Berries are elongated, cylindrical and amber coloured, T.S.S. around 22(^0) Brix, acidity 0.4% to 0.7%</td>
<td>16 mm to 19 mm</td>
</tr>
<tr>
<td>Sharad Seedless</td>
<td>Berries are oblong to elliptical in shape and bluish black in colour with T.S.S. 18-21(^0) Brix and acidity 0.5% to 0.7%</td>
<td>18 mm to 22 mm</td>
</tr>
<tr>
<td>Tas-e-Ganesh</td>
<td>Berries are ovoid shaped and green to amber in colour with T.S.S. 20-22(^0) Brix and acidity 0.5% to 0.65%</td>
<td>15 mm to 20 mm</td>
</tr>
</tbody>
</table>

1. **Thompson Seedless**: More than half of the world’s raisins and about 95% of California raisins are made from this variety. In India it is under mass
cultivation. Berry of Thompson seedless is yellowish to golden yellow when fully ripe. It’s elongated, less variable blooms pleasantly and has thin skin adherent. Poor transparency, medium thickness. The taste and flavours is very natural. It was first growth in California by William Thompson near Yuba City.

2. **Sonaka**: Sonaka is similar to Thompson Seedless except the berry size and cluster, which are more elongated than Thompson Seedless. Sizable area is under cultivation of the Sonaka variety. Sonaka has a far better response than Thompson Seedless.

3. **Sharad Seedless**: This was first identified by late Shri Nanasaheb Kale at Nanaj Solapur dist in Maharashtra and named as Sharad Seedless. Berries of Sharad Seedless are bold and brilliant black in coloured. It has thin skin. It is one of the choicest table varieties in India at present.

4. **Tas-e-Ganesh**: Certain buds sports from Thompson seedless are identified by some grape growers as Tas-e-Ganesh found in their own vine yard. This has all the qualities of Thompson seedless except that the berry size is larger.

5. **Jumbo seedless**: Jumbo seedless is newly introduced variety of grape. The main attribute of this hybrid variety is high yield. Less seasonal variations in berry size, reduced damage and berry drop in wet season and superior processing quality. Jumbo seedless has been introduced in India during the recent times and it has good acreage of cultivation in India.
5.2.1 Grape cultivation practices

Grape is a perennial crop. The average life of the grape is 18 to 20 years. The Indian conditions grape gardens are replaced after taking 13 to 14 commercial crops because of decreased productivity.

The land is tilled and laid into plots of 120 m x 180 m separated by 3 m wide roads. Land within a plot is levelled perfectly to have a gradient of less than 1 percent in any direction to ensure uniform discharge of water through the emitters of drip irrigation systems.

Trenches of 75 cm width, 75 cm depth and 118 m length in a north-south direction with a gap of 3 m between trenches are opened with heavy machinery. They are closed with topsoil, up to a height of 45 cm after 15 days exposure to sun. The remaining gap is filled with a mixture of soil, cattle manure, single superphosphate, sulphate of potash and micro-nutrients. Usually, 50 kg of cattle manure, 2.5 kg of superphosphate, 0.5 kg of sulphate of potash and 50 g each of ZnSO₄ and FeSO₄ are added to the soil for every running meter length of the trench.

5.2.1.a. Planting Season

The best season for planting the rooted cuttings of cultivated varieties in the main field is September-October whereas for rootstocks it is February-March.

b. Spacing

Spacing generally varies with the varieties and soil fertility. For vigorous varieties it is 6 m x 3 m or 4 m x 3 m and 3 m x 3 m or 3 m x 2 m for less vigorous varieties.
5.2.2 Multiplication on Own Roots

Grapes are multiplied exclusively by the rooting of hardwood cuttings. No Government agency is involved in the multiplication and supply of rooted cuttings. Growers themselves obtain the hardwood cuttings from elite vineyards and raise their own nurseries. Well matured canes obtained in September/October are selected. Cuttings of 4 nodes each with a thickness of 8 to 10 mm are made from the selected canes. The fresh cuttings are soaked in running water for 24 hours to leach out the water-soluble rooting inhibitors. The basal parts of cuttings are then dipped in a 2,000 ppm strong IBA solution for five minutes before planting. It is also a practice to plant the cuttings *in situ* when three to four cuttings prepared and treated as above are planted at each spot in the main field. Soil drenching with chlorophyriphos 0.1 percent is a practice to safeguard the cuttings against termite damage.

5.2.3 Raising on Rootstocks

Hardwood cuttings of the ‘Dogridge’ rootstock are subjected to rooting, preferably in polybags of 15 x 25 cm. Rooted cuttings of this rootstock are planted in the main field during February-March. The desired scion variety is then grafted/budded on the rootstocks in the field by wedge grafting/chip budding. Wedge grafting is more common and the best time for the operation is September-October, while June-July is the suitable time for chip budding.

Grape plant gives full crops from second year onwards, after plantation. In Indian conditions there is a practice of two pruning in a year. The pruning of the cuttings, which is done after harvesting the crop in the month of April or May is called BASEL of SPUR pruning. The second pruning is in the month of September –October i.e. FRUIT pruning.

There are two types of training systems of the plant one is called BOWER and second is T or Y type of training system. Generally the distance between the two rows is 9 to 10 feet and distance between the two plants is 5 to 6 feet i.e. 750 to 850 plants are planted in an acre.
After spur pruning the plant gets sprouting. These sprouts (canes) are controlled immediately. Generally one cane for one sq. feet area is proper ratio. At the same time fertilization is done in a proper proportion. 14 to 16 leaves are maintained on every cane in accordance with the desired LEAF INDEX of the plants and these leaves are properly protected throughout the rainy season from disease and funguses. It requires good plant protection schedule of fungicide and pesticide medicined. This period is generally called REST PERIOD which is important for the plant to recover its internal hormone, enzyme and food material levels of the plant. Buds of the cane gets fruitfulness within 60 to 80 days after Basel pruning which requires sufficient HEAT HOURS and SUNLIGHT.

The second and important phase starts after fruit pruning. Sufficient organic and inorganic fertilizers are in a particular ratio are applied in the area of working roots of the plant 3 to 4 weeks before this pruning. Hydrogen Cyananide is used on the buds to get even sprouting. Branches come out with sprouting. Excess bunches are removed and one bunch one sq. feet ratio is maintained. Well planned schedule of spraying of plant protection and hormones fudges and to get good development of bunches. 45 to 55 days after the pruning of bunches gloom. After that the berry setting stage comes and the treatment of G.A.-3is important in this particular stage. Each and every bunch is dipped twice in the solution of 40 to 50 ppm G-A-3 with desired interval To get good development of berries and good quality, the excess berries in the bunch are removed manually. This is called THINNING. The GURDLLING is also important practice. Throughout this period a particular level of moisture is to be maintained in the working of root zone of the plant 5 to 5 1/2months after pruning grapes are matured for harvesting 1month before harvesting all spraying is stopped to avoid residues on the grapes.

After harvesting a rest of 10 to 15 days is given to the plant to cope up the decreased internal of hormones, food material of the plant as the plant gets exhausted after giving nutrition to fruit of grapes for a period of 5 to 6 months on the plant.
5.3 Care and Management of Grape Plants

Many training systems are in vogue in India, but the most popular are Bower, Telephone and Flat Roof Gable systems.

**Bower System:** Owing to the high productive potential, bower was a very popular system of training in the past. It is highly suited for vigorous varieties like Anab-e-Shahi, Bangalore Blue and Gulabi. But in varieties like Thompson Seedless and Tasa-Ganesh where vine vigour and excessive foliage density affects the productivity adversely, this system is not popular.

**Telephone System:** T-trellis is used in this system of training. With three top wires and ‘T’ shaped supports, the trellis looks like a telephone pole and wires and hence the name. This system is followed for moderately vigorous varieties like Thompson Seedless and other seedless cultivars in about 25-30 percent of the vineyard area in Maharashtra. Yields in this system are less than the bower. In very hot and dry places, sunburn of the berries and of the arms are experienced in summer.

**Flat Roof Gable System:** Combining the advantage of bower and the extended Y systems and eliminating their disadvantages, an inter-connected Y trellis forming a flat roof gable is being adopted. This system is particularly followed for vigorous vines (vines grafted on rootstocks). The bunches are protected from direct sunlight and well exposed to sprays of pesticides. The clusters hang within the reach of the worker of an average height. Owing to these advantages, this system is gaining popularity among the growers in Maharashtra, Andhra Pradesh and Karnataka.

5.3.1 Pruning of Grape vines (Plants)

Three distinct pruning practices are in vogue in relation to cropping in the three grape growing regions of the country. In the sub-tropical region, vines are pruned only once in December and the crop is harvested once. Half of the canes are pruned to renewal spurs and the rest to fruiting canes (3-4 nodes for Perlette).
In hot tropical regions, vines are pruned twice but only one crop is harvested. All canes in a vine are pruned back to single node spurs in March-May to develop canes and the canes are forward pruned in October-November for fruiting. The number of nodes retained on a cane varies with the variety and cane thickness. There is no scope to prune earlier than October and later than November due to unfavourable weather conditions. In the mild tropical region, vines are pruned twice and the crop is harvested twice. In varieties like Gulabi and Bangalore Blue, which are fairly resistant to rain damage and in which fruit bud differentiation is not impaired by cloudy weather and rains, pruning is done at any time of the year. As a result, five crops are harvested every two years.

5.3.2 Application of Manure and Fertilizers

As vineyard soils are either sandy loams or heavy clays, the usage of organic manure has assumed high importance in India. A standard dose of 500:500:1000 kg of N, P$_2$O$_5$ and K$_2$O per hectare is followed in light sandy soils, while 660:880:660 kg are applied for heavy clay soils. The annual dose is fixed based on the petiole analysis carried out at 45 days after spur pruning. While 40 percent of the annual dose is given through organic sources, 60 percent is given as inorganic fertilizer. Calcium ammonium nitrate is usually not used. Sulphate of potash is the only source of potash used in place of muriate, particularly in heavy clay soils. Recently application of soluble fertilizers through drip irrigation is picking up. 40 percent of N, 50 percent of P$_2$O$_5$ and 33 percent of K$_2$O of the annual dose is given during the growth season and the rest in the fruiting season.

5.3.3 Weeding

Weeds between the rows of vines are removed mechanically by tractor drawn implements. Within the rows, weeds are manually hoed and removed. Sometimes the post-emergent weedicides, mainly glyphosate at about 2.0 kg/ha or paraquat at about 7.5 kg/ha is sprayed in fully grown vineyards.
5.3.4 Supplementary Irrigation

Since grapes are grown in areas where the evapotranspiration exceeds the precipitation, irrigation is essential. Less than 10 percent of the vineyard areas are surface irrigated, while the rest is irrigated by drip systems. Water requirement is calculated based on the pan evaporation using 0.8 as the crop factor. Water is applied at different rates at different stages of vine growth and berry development.

5.3.5 Pests and their Management

The important pests of grapes in India are, flea beetles, thrips, mealy bugs and leaf hoppers.

**Flea beetles**: The adult beetles scrape the sprouting buds and eat them up completely after each pruning. Damaged buds fail to sprout. Insecticides like carbaryl at 0.15 percent, quinolphos at 0.05 percent, dichlorvas at 0.1 percent or phosalone at 0.05 percent are sprayed from the fourth day until the emergence of leaves.

**Thrips**: Thrips attack the ovaries of flowers and newly set berries and suck sap from them. The affected berries develop a corky layer and become brown on maturity. Scab formation on the berry surface is also due to thrip damage to the ovaries/young berries. Such berries are not suitable for marketing. Thrips are effectively controlled by spraying phosphamidon at 0.05 percent, carbaryl at 0.125 percent, phosalone at 0.05 percent or malathion at 0.05 percent. Prophylactic sprays of insecticides against thrips are given once in five days from the initiation of bloom to berry set.

**Mealy Bugs**: Mealy bugs are the most serious and problematic pests of grapes in India. Nymphs and adults suck sap from the tender shoots resulting in crinkling and stunting of the new shoots. They excrete honey on leaves and berries and sooty mold develops on the honey. Mealy bug infected bunches are unfit for marketing. Yield losses can be up to 50 percent due to mealy bug damage. Mealy bugs are hard-to-kill insects and the package of practices for their control in India is as follows:
i) Avoid spraying broad-spectrum insecticides particularly synthetic pyrethroids.

ii) Spray only dichlorvas at 0.1 percent mixed with neem oil 0.2 percent or tridemorph at 0.1 percent.

iii) Release *cryptolaemus montrozieri* beetles at 8,000-10,000 per hectare when the berries start softening. It is better to release a mixed population of grubs and adults rather than only adults.

**Leaf hoppers:** This pest has assumed serious proportions in all grape growing regions of India in recent years. The adults and young nymphs of hoppers suck sap exclusively from the lower side of the leaves. Carbaryl at 0.15 percent, fenitrothion at 0.04 percent, phosalone at 0.05 percent or quinalphos at 0.05 percent are sprayed to control this pest. A mixture of quinalphos at 0.05 percent and phosalone at 0.05 percent is more effective on the nymphs while tridemorph at 0.1 percent only is effective on the adults.

### 5.3.6 Diseases and their Management

The important grape diseases are anthracnose, downy mildew, powdery mildew and bacterial leaf spot. In recent years, *Alternaria* is also becoming a serious pathogen.

**Anthracnose** is prevalent in all grape growing regions of the country. The disease is characterized by small light brown or greyish black lesions on tender shoots, young leaves, flowers and young berries. Bordeaux mixture at 0.8 percent, copper oxychloride at 0.25 percent or carbendazim at 0.1 percent are used to control this disease.

**Downy mildew** is the most devastating disease of grapes in the tropical region of the country. The disease mainly appears on the leaves, but also attacks the flower
clusters and young fruits. The losses are very high when it attacks the clusters before fruit set. Entire clusters decay, dry and drop down. Properly neutralized Bordeaux mixture at 1 percent, copper oxychloride at 0.2 percent, Mancozeb at 0.2 percent, metalaxyl (Ridomil Mz at 0.2 percent) or Phosethyl-Al (aliettle at 0.2 percent) are used against this disease.

Powdery mildew is prevalent in all the grape growing regions. It is next in importance to downy mildew in its devastating severity. The disease is characterized by the presence of white powdery (ash like) coating in patches on both sides of the leaves, young shoots and immature berries. Powdery mildew is controlled easily by wettable Sulphur formulations. A wide range of fungicides, namely, Calaxin at 0.07 percent, Karathane EC at 0.04 percent, Myclobutanil (Systhane at 0.05 percent), Triademifon (Bayleton at 0.1 percent) and Penconazol (Topas at 0.025 percent) are used to control this disease.

Bacteria infects leaves, shoots and berries. The symptoms appear as minute water soaked spots on the lower surface of the leaves, especially along the main and lateral veins. Mostly these spots coalesce and form larger patches. Severely infected leaves give a blighted appearance. Streptocyclin at 500 ppm is used as a prophylactic spray, while Bordeaux mixture at 0.8 percent or copper oxychloride at 0.15 percent is used to check its spread.

5.3.7 Physiological Disorders

Physiological disorders associated with high temperature and low atmospheric humidity in the hot tropical region are dead arm and trunk splitting. Salinity injury is common in Maharashtra and north Karnataka. Other physiological disorders are cane immaturity, water berries, cluster tip wilting, shot berries, uneven ripening and post-harvest berry drop. The eco-physiological disorders are ‘coulure’, blossom-end rot, pink berry syndrome, berry cracking and rotting.
5.4 Quality Improvement

Shoot and Cluster Thinning: Only one or two clusters are retained per cane depending upon the density of the latter. Irrespective of the number of clusters, only the apical two or three shoots are retained. In vines trained to the flat roof gable, individual shoot length is encouraged rather than the total canopy size for preventing sunburn of the berries.

Production of Loose Clusters: Pre-bloom GA sprays of 10 ppm and 15 ppm are given respectively on the 11th to 14th day after bud break for cluster elongation. Rachides of the clusters are trimmed to retain 8-10, depending on the number of leaves available per cluster. Clusters are dipped in GA solution of 30-40 ppm when 10-20 percent of the flowers open in each cluster for berry thinning.

Increasing Berry Size: Manual means are used to supplement chemical thinning to ensure adequate berry thinning and improve the quality of grapes. Approximately 90-120 berries are retained per cluster depending upon the number of leaves available to nourish it at 8-10 berries per every leaf depending on its size. Clusters are dipped in GA solution of 40-50 ppm concentration once at 3-4 mm size of the berries and again at 7-8 mm size. When berry diameter is to be increased to more than 16 mm, clusters are dipped in a mixture of 10 ppm BA + 25 ppm GA or 2 ppm CPPU + 25 ppm GA or 1 ppm brassinosteroid + 25 ppm GA instead of GA alone at these two stages.

In addition to the treatment with growth regulators, berry size and crispiness are increased by girdling. The width and depth of girdling are 1-1.5 mm. Girdling is done at 4-5 mm diameter of the berries.

Increasing the TSS Content: Berry thinning and cluster thinning to maintain adequate leaf/fruit ratio (5 cm²), while girdling will ensure a TSS content of 20°B.
Table 5.2: Harvesting and Yields

<table>
<thead>
<tr>
<th>Variety</th>
<th>Yield (t/ha)</th>
<th>Period of Harvest</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Average</td>
<td>Potential</td>
</tr>
<tr>
<td>Anab-e-Shahi</td>
<td>45</td>
<td>February-May, July, November-December</td>
</tr>
<tr>
<td>Bangalore Blue</td>
<td>40</td>
<td>January-March, June-December</td>
</tr>
<tr>
<td>Bhokri</td>
<td>30</td>
<td>November-December, June-July</td>
</tr>
<tr>
<td>Gulabi</td>
<td>30</td>
<td>January-March, June-December</td>
</tr>
<tr>
<td>Perlette</td>
<td>40</td>
<td>June</td>
</tr>
<tr>
<td>Thompson Seedless and other seedless varieties</td>
<td>25</td>
<td>January-April</td>
</tr>
</tbody>
</table>

Source: NRC for Grapes Pune

However, the major proportion of produce, mainly of Anab-e-Shahi, Thompson Seedless and its clones, is harvested during March-April from the hot tropical region, which contributes more than 70 percent of the total harvest.

The productivity of grapes in India is very high, particularly in the Hyderabad region. Yields as high as 100 t/ha in Anab-e-Shahi and 75 t/ha in Thompson Seedless were recorded in this region. However, quality of grapes is usually poor as a result of high yields.

5.5.1 Potential for Grape Production Development

Nasik has the distinction of achieving the highest productivity in grapes in the world, with an average yield of 30 t/ha.

a) Sustaining productivity and minimizing risks in grape cultivation is possible because of the availability of a variety of agro-climatic regions suitable for grape cultivation for table, raisin and wine grapes.
b) Technologies to achieve high productivity are currently available.

c) Scope for double cropping in certain regions and harvesting round the year in certain varieties is practically feasible.

d) Technologies to produce export quality grapes and quality raisins are available.

5.5.2 Constraints in Grape Production Development

Although grape cultivation is considered as highly remunerative, the area under grapes is confined to only 34,000 hectares due to the following constraints.

a) Heavy initial investment for establishing a vineyard.

b) High recurring costs in vineyard management.

c) Narrow variety base and lack of diversity in utilization of the germplasm available in grape growing countries.

d) High risk of losing the crop due to unprecedented changes in weather.

e) Soil and water salinity in Maharashtra and drought in the hot tropical areas.

f) Short period available for ripening in the north.

g) Very low proportion of export quality grapes.

h) Wine is not a popular drink at present.

i) Marketing problems in table grapes.
Flow Chart of Grape Production & Processing

**Grafted Seedlings/Root Stalk**

1. Land
   - Labour
   - Farm Machinery
   - Irrigation Water
   - Chemical Fertilizers
   - FYMC Compost

2. Growth Promoters
   - Vineyards
   - Pesticides/Insecticide

3. Pruning
   - Girdling
   - Thinning
   - GA Treatment

4. Harvesting
   - Wine Making
   - Packing (Table Grapes)
   - Raisin Making

5. Distributor
   - Pre-cooling
   - Packing
   - Cold Storage

6. Retailer
   - Domestic Market
   - Export Market

7. Consumer
   - Trader
   - Super Market

8. Trader
   - Consumer
5.6 Improvements in Cultivation practices/Technology:

The extraction of high yield from the existing grape gardens was resulting in reduction of its economical life and deterioration of the quality. Further “the flow irrigation” method then popularly adopted resulted into higher consumption of water. As there was a shortage of water during summer seasons so the farmers gradually resorted to “drip irrigation system”, which was being offered at a subsidized rate by the state government.

The latest technology adopted by the farmers through knowledge from Research Centre, visits to other countries, Agricultural universities and their own experiments have helped them to monitor the quality of grapes such as size of bunches, sugar acid ratio, berry size, pesticide residue, shelf life, colour appearance etc. The introduction of planting on the root stock of Dogridge (B) variety has given tremendous advantages to the farmers to overcome difficulties such as water stress, salinity, quality etc. The technical and research support from the grape research centers and Agricultural Universities however is not keeping pace with the developments taking place world over.

5.7 Growth Rate and Performance

The growth of the grape cluster was steady and continuous with increase in cultivation area, the exportable grapes per acre and the total tonnage per year. Due to easy access to the technology through literature, training programmes etc more and more enterprising farmers entered into this field. Some have picked up export business of their own cultivated grapes in addition to bought out produce, after establishing pre-cooling units. While others have preferred to convert grapes into raisins before selling them in the markets at a later date. Some have even resorted to cultivation of wine varieties imported from abroad particularly for wine-production. This wine sector has been given many concessions by the State and Central governments recently.
The farmers who visited European countries and attended international exhibitions have given them more exposure and awareness about the challenges before them. They are therefore pressing the central and state governments to take quick positive steps to maintain their position in the international grape market. The other countries like Chile, Israel etc. are threatening our position by introducing new varieties of grapes, which will be available during the late April and May. Indian and mainly Nasik farmer is however fortunate that unlike Chile they have huge domestic market to fall back upon.

There is a continuous improvement in the performance in spite of some setbacks during the last few years due to natural calamities and low international rates. The financial institutions including nationalized banks and cooperative banks are always ready to finance a grape grower. The overall NPA percentage in case of grape grower is normally in the range of 1 to 2% only. The grape gardens have failed only when the venture is started by a farmer without testing the soils or verifying the availability of basic inputs. The grape cultivation also requires constant attention and entrepreneur has to be always vigilant and watchful.

This group of progressive farmers is facing challenges both at the local level as well as from the international markets. The grapes produced from Chile, South Africa, Israel have reduced the export window for Indian grapes in European market forcing them to search for an alternative outlet. Although our farmers are ready to spend considerable amount of money and labour yet many of them lack the knowledge regarding latest methods for increasing productivity, new time management techniques, marketing infrastructure and professional marketing skills. Also the climatic conditions in India are not exactly suitable for production of quality grapes as demanded by the European consumer and therefore the farmers have to spend huge sums of money on manipulating the harvesting period, controlling the diseases and the pesticide residues.
## Taluka wise area under grape cultivation over ten year period from 1999-00 to 2008-09 (in ha)

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Nasik</td>
<td>1815</td>
<td>1875</td>
<td>1940</td>
<td>2145</td>
<td>2170</td>
<td>2246</td>
<td>2145</td>
<td>2306</td>
<td>2506</td>
<td>2618</td>
</tr>
<tr>
<td>2</td>
<td>Igatpuri</td>
<td>07</td>
<td>11</td>
<td>14</td>
<td>19</td>
<td>19</td>
<td>19</td>
<td>17</td>
<td>19</td>
<td>35</td>
<td>52</td>
</tr>
<tr>
<td>3</td>
<td>Sinner</td>
<td>112</td>
<td>136</td>
<td>186</td>
<td>206</td>
<td>196</td>
<td>180</td>
<td>195</td>
<td>210</td>
<td>205</td>
<td>225</td>
</tr>
<tr>
<td>4</td>
<td>Niphad</td>
<td>9640</td>
<td>9900</td>
<td>10200</td>
<td>10780</td>
<td>11200</td>
<td>10950</td>
<td>10980</td>
<td>11200</td>
<td>15250</td>
<td>16450</td>
</tr>
<tr>
<td>5</td>
<td>Yeola</td>
<td>20</td>
<td>33</td>
<td>32</td>
<td>52</td>
<td>46</td>
<td>45</td>
<td>48</td>
<td>51</td>
<td>55</td>
<td>72</td>
</tr>
<tr>
<td>6</td>
<td>Nandgaon</td>
<td>05</td>
<td>05</td>
<td>07</td>
<td>09</td>
<td>07</td>
<td>05</td>
<td>09</td>
<td>10</td>
<td>12</td>
<td>15</td>
</tr>
<tr>
<td>7</td>
<td>Chandwad</td>
<td>860</td>
<td>902</td>
<td>1120</td>
<td>1362</td>
<td>1350</td>
<td>1430</td>
<td>1420</td>
<td>1460</td>
<td>1455</td>
<td>1960</td>
</tr>
<tr>
<td>8</td>
<td>Malegaon</td>
<td>07</td>
<td>10</td>
<td>11</td>
<td>12</td>
<td>10</td>
<td>09</td>
<td>12</td>
<td>11</td>
<td>32</td>
<td>40</td>
</tr>
<tr>
<td>9</td>
<td>Baglan</td>
<td>240</td>
<td>270</td>
<td>360</td>
<td>435</td>
<td>420</td>
<td>415</td>
<td>465</td>
<td>475</td>
<td>455</td>
<td>675</td>
</tr>
<tr>
<td>10</td>
<td>Kalwan</td>
<td>60</td>
<td>48</td>
<td>96</td>
<td>157</td>
<td>140</td>
<td>158</td>
<td>162</td>
<td>130</td>
<td>175</td>
<td>220</td>
</tr>
<tr>
<td>11</td>
<td>Deola</td>
<td>03</td>
<td>08</td>
<td>12</td>
<td>17</td>
<td>15</td>
<td>12</td>
<td>19</td>
<td>20</td>
<td>26</td>
<td>52</td>
</tr>
<tr>
<td>12</td>
<td>Peth</td>
<td>01</td>
<td>01</td>
<td>01</td>
<td>01</td>
<td>04</td>
<td>04</td>
<td>03</td>
<td>07</td>
<td>07</td>
<td>15</td>
</tr>
<tr>
<td>13</td>
<td>Surgana</td>
<td>01</td>
<td>02</td>
<td>02</td>
<td>02</td>
<td>05</td>
<td>06</td>
<td>08</td>
<td>15</td>
<td>20</td>
<td>35</td>
</tr>
<tr>
<td>14</td>
<td>Trimbakeshwar</td>
<td>00</td>
<td>00</td>
<td>00</td>
<td>00</td>
<td>05</td>
<td>10</td>
<td>05</td>
<td>09</td>
<td>15</td>
<td>26</td>
</tr>
<tr>
<td>15</td>
<td>Dindori</td>
<td>3200</td>
<td>3600</td>
<td>4200</td>
<td>4800</td>
<td>4815</td>
<td>4900</td>
<td>5200</td>
<td>6400</td>
<td>6550</td>
<td>8215</td>
</tr>
</tbody>
</table>

Source: APEDA 2009-10
Taluka wise progress in grape cultivation

From the table 5.3 seen in the previous page we see that every taluka of Nasik district has been showing slow and steady increase in area of cultivation for grapes. Nasik taluka had 1,815 hectares of cultivated land covering grapes in 1999-2000. The area under cultivation increased up to 2,610 hectares by the end of 2008-09. Igatpuri taluka, Yeola, Nandgaon, Malegaon, Deola, Peth, Surgana and Trimbakeshwar had very less area cultivated under grapes, but still there was slight improvement in area under cultivation by the end of 2008-09. The major talukas which have higher land area cultivated for grape fruits and vine yards are Nasik, Niphad, Dindori, Chandwad, Baglan and sinner. Of these talukas Niphad taluka has the highest area under cultivation and has shown highest increase in area under cultivation over the ten year period of 1999-2000 to 2008-09.

After Niphad taluka, Dindori has shown growth in area under cultivation from 3,200 hectares in 1999-2000 to 8,200 hectares in 2008-09. Dindori Taluka has most favourable conditions after Niphad taluka for the cultivation of grapes.

Nasik taluka is third highest in land area cultivated under grapes. This taluka had 1,815 hectares in 1999-2000 and this area under cultivation of grapes increased to 2,610 hectares by 2008-09.

Fourth in the position of area of cultivation of grapes is Chandwad taluka, which had 860 hectares of land cultivated under grapes in 1999-2000 and this area under cultivation of grapes increased to 1,960 hectares by the end of 2008-09. Chandwad taluka is followed by Satana (Baglan) taluka, which had 240 hectares of cultivated land for grapes in 1999-2000 and this area under cultivation increased to 675 hectares by the end of 2008-09.
The talukas like Kalwan, Sinner, Yeola, Deola, Peth, Surgana, Malegaon and Trimbakeshwar have very less area under cultivation for grapes because these talukas have more potential for food grains like rice, maize and Bajra and as well fruits like Pomogranate.
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Nasik</td>
<td>38650</td>
<td>38960</td>
<td>41360</td>
<td>45045</td>
<td>45875</td>
<td>46066</td>
<td>45010</td>
<td>47650</td>
<td>54135</td>
<td>56560</td>
</tr>
<tr>
<td>2</td>
<td>Igatpuri</td>
<td>86</td>
<td>102</td>
<td>165</td>
<td>285</td>
<td>180</td>
<td>260</td>
<td>225</td>
<td>255</td>
<td>625</td>
<td>935</td>
</tr>
<tr>
<td>3</td>
<td>Sinner</td>
<td>28645</td>
<td>3164</td>
<td>3964</td>
<td>4120</td>
<td>3920</td>
<td>3648</td>
<td>3966</td>
<td>4060</td>
<td>3986</td>
<td>4564</td>
</tr>
<tr>
<td>4</td>
<td>Niphad</td>
<td>196864</td>
<td>201064</td>
<td>223644</td>
<td>237160</td>
<td>252648</td>
<td>239620</td>
<td>241260</td>
<td>262646</td>
<td>319846</td>
<td>376426</td>
</tr>
<tr>
<td>5</td>
<td>Yeola</td>
<td>485</td>
<td>534</td>
<td>520</td>
<td>1092</td>
<td>986</td>
<td>954</td>
<td>976</td>
<td>1020</td>
<td>1196</td>
<td>1564</td>
</tr>
<tr>
<td>6</td>
<td>Nandgaon</td>
<td>70</td>
<td>90</td>
<td>110</td>
<td>135</td>
<td>110</td>
<td>96</td>
<td>135</td>
<td>145</td>
<td>260</td>
<td>315</td>
</tr>
<tr>
<td>7</td>
<td>Chandwad</td>
<td>10260</td>
<td>11208</td>
<td>16120</td>
<td>24120</td>
<td>24100</td>
<td>26230</td>
<td>26105</td>
<td>27290</td>
<td>27150</td>
<td>4664</td>
</tr>
<tr>
<td>8</td>
<td>Malegaon</td>
<td>170</td>
<td>190</td>
<td>210</td>
<td>240</td>
<td>195</td>
<td>160</td>
<td>260</td>
<td>215</td>
<td>862</td>
<td>973</td>
</tr>
<tr>
<td>9</td>
<td>Baglan</td>
<td>5672</td>
<td>5964</td>
<td>7864</td>
<td>8702</td>
<td>8560</td>
<td>8017</td>
<td>8005</td>
<td>8965</td>
<td>8765</td>
<td>12680</td>
</tr>
<tr>
<td>10</td>
<td>Kalwan</td>
<td>1046</td>
<td>980</td>
<td>1936</td>
<td>3140</td>
<td>2875</td>
<td>3200</td>
<td>3016</td>
<td>2016</td>
<td>3316</td>
<td>3876</td>
</tr>
<tr>
<td>11</td>
<td>Deola</td>
<td>45</td>
<td>72</td>
<td>124</td>
<td>175</td>
<td>160</td>
<td>102</td>
<td>220</td>
<td>240</td>
<td>312</td>
<td>610</td>
</tr>
<tr>
<td>12</td>
<td>Peth</td>
<td>15</td>
<td>12</td>
<td>14</td>
<td>15</td>
<td>26</td>
<td>22</td>
<td>20</td>
<td>29</td>
<td>62</td>
<td>79</td>
</tr>
<tr>
<td>13</td>
<td>Surgana</td>
<td>15</td>
<td>10</td>
<td>15</td>
<td>30</td>
<td>30</td>
<td>75</td>
<td>90</td>
<td>105</td>
<td>140</td>
<td>210</td>
</tr>
<tr>
<td>14</td>
<td>Trimbakeshwar</td>
<td>00</td>
<td>00</td>
<td>00</td>
<td>72</td>
<td>60</td>
<td>76</td>
<td>90</td>
<td>102</td>
<td>160</td>
<td>200</td>
</tr>
<tr>
<td>15</td>
<td>Dindori</td>
<td>88568</td>
<td>92685</td>
<td>98833</td>
<td>105600</td>
<td>157236</td>
<td>158384</td>
<td>163674</td>
<td>229160</td>
<td>248415</td>
<td>286425</td>
</tr>
</tbody>
</table>

Source: APEDA 2009-10
Table 5.4 shown on the previous page is related to the production in Metric Tonnes (MT) of all talukas of Nasik district over the ten years period from 1999-2000 to 2008-09. From the table we see that Niphad taluka has registered highest production when compared to other talukas in the district. The production of grapes in 1999-2000 was 1,96,864 tonnes in Niphad taluka. The production increased to 3,76,426 tonnes by the end of 2008-09. After Niphad, Dindori taluka has registered a production of 88,568 tonnes in 1999-2000 and this production increased up to 2,86,425 tonnes by the end of 2008-09. Both Niphad and Dindori have shown healthy growth and increase in cultivation of land for grapes and also production of grapes over the ten years.

Nasik taluka has registered the production of grapes to 38,650 tonnes in 1999-2000. A gradual but steady improvement of production of grapes is observed in this taluka over the ten year period and by the end of 2008-09 the production of grapes was 56,675 tonnes.

After Niphad, Dindori and Nasik talukas, Chandwad and Baglan talukas have shown average but steady increase in the production of grapes over the ten year periods. Chandwad had a production of 10,260 tonnes in 1999-2000 and this production increased to 46,650 tonnes by the end of 2008-09, while Baglan had a production of 5,672 tonnes in 1999-2000 and this production increased to 12,680 tonnes by the end of 2008-09.

After these five leading talukas Sinner and Kalwan talukas also have shown good amount of production of grapes and a steady growth also over the ten year period. Sinner taluka had a production of 2,864 tonnes in 1999-2000 and this production increased to 4,564 tonnes by the end of 2008-09. In Kalwan taluka the production of grapes in 1999-2000 was 1,046 tonnes and this production increased to 3,875 tonnes.

The other talukas of the district namely Igatpuri, Yeola, Nandgaon, Malegaon, Deola, Peth, Surgana and Trimbakeshwa have very less production and also less
hactarage land of cultivation for grapes. In these talukas we find mainly food grains and pomegranate cultivated.

Table 5.5: Quality Requirements for Exportable Grapes

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Requirement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bunch shape</td>
<td>Oblong ,Conical</td>
</tr>
<tr>
<td>Bunch Weight</td>
<td>400gm- 600 gm</td>
</tr>
<tr>
<td>Berry</td>
<td>Spherical, Greenish, Diameter above 18mm, weight 3 gm- 5 gm</td>
</tr>
<tr>
<td>Firmness</td>
<td>Firm, Strong, pulpy, skin without cracks</td>
</tr>
<tr>
<td>T.S.S.</td>
<td>18-22 Brix</td>
</tr>
<tr>
<td>Acidity</td>
<td>0.50% to 0.65%</td>
</tr>
<tr>
<td>Others</td>
<td>No spots, Bruises or residues of any chemicals. No. off flavour/odour/taste</td>
</tr>
</tbody>
</table>

Source: APEDA standards

From the above table we see that the exportable grapes have specific requirements from the very plant and bunch shape of the fruits and berries. The acidity contents and chemical criteria are also specifically mentioned to maintain international standards.

Speaking to Business Standard, Dhananjay Wardekar, agriculture officer, said, "Corporate entry into grape exports has been very fruitful. Till date (May 14), 27,650 mt has been exported to 13 countries including the UK, Germany, Russia, Belgium, Dubai, Singapur, Hongkong and Taiwan." He further said, "This season, 131 firms exported grapes from Nasik. In 2007-08, around 14,396 growers were given registration certificates by the district agriculture superintendent for exports. Around 2,143 phyto-sanitary certificates, which are compulsory for grape exports as per guidelines of Agricultural and Processed Food Products Export Development Authority (APEDA), were given to these exporters."
Flow chart - II

- People & Organizations involved in Export enhancement of Nasik grapes

- Grape Cultivator
  - Financial institutes/Commercial banks/Co-op banks
  - Commission agents and traders
  - Fabricator & Agri-machinery
  - NRC-grapes Agricultural University
  - Pre-cooling units
  - Fertilizer & Pesticide dealer

Export
5.8 Export and export potential

Domestic strengths for exporting grapes are enumerated in following paragraphs:-

- Grapes in Nasik are mainly cultivated in tropical region of the district where vines are pruned twice. Fruit pruning can be adjusted to harvest the crop as per the demand of the importing country.

- Technology for production of Extra Class or Class I table grapes is available in the country.

- The grape growers of the country are very innovative and very much receptive to new technologies and have registered with GLOBALGAP certification.

- Yields of grapes in India are highest in the world. The Nasik grapes have the lions share in the yield.

- Farmers of different regions have organized themselves by forming Association / co-operatives and thus transfer of technology is easy.

- Agri- Export- Zones for enhancing exports of grapes have been established.

- Farmers of Maharashtra state in cooperation with MSAMB have branded their product as MAHA GRAPE.

- The grape cultivators have research support from NRC for grapes, Pune, IIHR, Bangalore and State Agricultural Universities.

- Grape growers in cooperation with MSAMB and APEDA have set up modern pack-houses for handling and packing of grapes for exports.
• APEDA has already set up a residue analysis laboratory at Pune for grape growing area of Maharashtra in order to cater to phytosanitary requirements of importing countries.

• Geographically India is at an advantageous position as compared to Chile, South Africa and Israel for exporting grapes to South East Asian countries like Hong Kong, Singapore etc. especially from Nasik and Sangli district

There is a phenomenal rise in export of grapes from India, as only 25,567 tons were exported during 2002-2003 which has increased to 85,562 tons in 2006-2007.(APEDA database).

Increase has been observed mainly in the last 2-3 years, because of the fact that India has met the requirements of EU countries on minimization of pesticide residues

<table>
<thead>
<tr>
<th>Year</th>
<th>Grapes Export (in Metric Tons)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1999-2000</td>
<td>4,051</td>
</tr>
<tr>
<td>2000-01</td>
<td>2,376</td>
</tr>
<tr>
<td>2001-02</td>
<td>3,775,,37</td>
</tr>
<tr>
<td>2002-03</td>
<td>4,532</td>
</tr>
<tr>
<td>2003-04</td>
<td>8,631.63</td>
</tr>
<tr>
<td>2004-05</td>
<td>13,357</td>
</tr>
<tr>
<td>2005-06</td>
<td>16,700</td>
</tr>
<tr>
<td>2006-07</td>
<td>19,000</td>
</tr>
<tr>
<td>2007-08</td>
<td>27,650</td>
</tr>
<tr>
<td>2008-09</td>
<td>24,630</td>
</tr>
</tbody>
</table>

Source : NRC for Grapes Pune
At Nagpur market (above table), traders brought the grapes from production areas after packing and transportation and sold it in wholesale market where retailer from the local markets purchased the fruit (channel I) or trader from the nearby towns such as Raipur, Durg or Bhilai (M.P.), came to purchase the produce (channel II). As the channel got longer and commodity went farther, marketing cost increased as more functionaries came in the trade. Ultimately consumer had to buy produce at higher price. In channel II, marketing efficiency was just 0.48. If producers have their own marketing organization, they can tap these markets by selling the produce directly to retailer and thus get better returns.

Nasik, the grape capital of India, has recorded 45.52 per cent rise in export of grapes in FY08 (December-April season) compared with last year, earning foreign exchange worth Rs 174.20 crore. In the last six years, grape export from the district has risen over seven-fold, from 3,775.37 metric tonnes (mt) in FY02 to 27,650 mt in FY08. But in 2009 there was decline in export of grapes due to rejection by European Union due to excess chemical residues.

5.9 Export potential for Nasik Grapes

There is a tremendous potential of export of grapes from Nasik district. The detailed account of potential of exports is given below:

(i) GCC Countries

As per APEDA database, nearly, 9677 tons of grapes were exported to GCC countries. This is negligible compared to imports of 64,170 tons during 2006 (Comtrade database). India exported only 8140 tons to UAE against total import of 21,240 tons (2006). Again to Saudi Arabia, our exports were only 1115 tons compared to imports of 31,853 tons. Similarly our exports to other GCC countries were minimal. Main competition of India is with South Africa and Chile. There is no reason why we cannot penetrate more in GCC countries especially in Saudi Arabia, when we have quality grapes, are meeting stringent quality control requirements of importing
countries and are offering grapes at competitive prices. Moreover, India location wise is nearer to GCC countries. Thus, it should not be difficult to accelerate exports of grapes to the tune of 40,000 to 50,000 tons to GCC countries in next 4-5 years.

(ii) **European Union**

Exports of grapes from India are maximum to European Union during 2006-2007. As much as 34,186 tons were exported during the year. Largest importers were Netherlands (19,020 tons) and UK (13,579 tons). It must be noted that India produces grapes mainly during January to April months, whereas countries like U.S.A, Argentina, Italy, Spain etc. produce grapes during September to December months. Our competition, therefore, is with countries like South Africa, Chile and Israel who supply grapes in the months when we supply. These countries have exported up to 3,42,896 tons during 2006 to a select few European countries comprising U.K, Netherlands, France, Belgium, Italy and Spain. Since India is meeting quality requirements including pesticide residues of all the importing countries in EU and supplying grapes at competitive prices, there is no reason why we cannot penetrate in the markets of Belgium, Germany, Spain and have larger share of imports in Netherlands and UK. Thus, it should not be difficult to meet the targets of export of 20 to 25% of total imports of EU i.e. 3,42,896 tons of grapes in this season in next 4-5 years.

Russian Federation imports as much as 3,20,677 tons in addition to imports of Ukraine to the tune of 55,168 tons. Therefore, India must make concentrated efforts to accelerate export of grapes to these countries also.

(iii) **ASEAN countries**

ASEAN countries import grapes to the tune of 1,04,477 tons. The demand for grapes has increased by 50% from the year 2003. The main importers are Indonesia (26,366 tons), Philippines (14,748 tons), Singapore (12,166 tons) and Vietnam (11,025
tons). Main competitors with India for export of grapes to these countries are U.S.A, Australia, China and South Africa. Out of total quantity of 1,04,477 tons, approx 40,000-50,000 tons are supplied by U.S.A , 17,000 to 20,000 tons by Australia and 10,000- 11,000 tons by China and South Africa each. However, supplies from U.S.A and China are during September to December months and thus India’s competition is with South Africa, Chile and Australia. India can easily compete with these countries, as India location wise is closer to ASEAN countries compared to South Africa and Chile. Moreover, India is supplying grapes at competitive prices.

At present, India has exported only 196 tons to Malaysia, 93 tons to Singapore, 78 tons to Thailand, 34 tons to Indonesia and 13 tons Vietnam during 2006. These export volumes are negligible compared to the potential that exists. Moreover because of free trade agreements with Thailand and Singapore (likely to be signed very soon), exports of grapes are likely to accelerate, as even otherwise import duties of the order of 5-7% only are imposed by Malaysia, Philippines and Indonesia. Thus, in next 4-5 years time, target of export of 10,000- 15,000 is not difficult to meet as India is producing quality grapes and is able to meet quality requirements. India must campaign aggressively and nurture these markets.

(iv) Hong Kong

Hong Kong is a trade hub and imported up to 91,517 tons and exported up to 46,868 tons during 2006. However, India exported only 156 tons during 2006. There is excellent potential and also possibility of realizing higher prices in Hong Kong market. India must make aggressive campaign and nurture the market.

(v) Pacific Rim countries and China

Pacific Rim countries comprising South Korea, Japan and Australia are also importing grapes to the extent of 17,921, 9949 and 4759 tons respectively. At present India is not exporting any quantity of grapes to these countries. It is expected that with
the signing of Free Trade Agreement with South Korea, export of grapes should initiate. Similarly with China, grape export should be explored as China has imported 46,021 tons of grapes during 2006. India and China are participants in Asia Pacific Trade Agreement.

5.10 Conclusions

Nasik district has the most favourable physiographic conditions that suit the grape cultivation. This has been very well exploited by the farmers of Niphad, Dindori, Nasik, Chandwad and Baglan talukas. The farmers awareness in understanding the requirements of international business and export qualities of their produces is very well understood from the fact that, the number of farmers getting registered for exports has increased to four figure mark. Secondly, the government and the exporting agents have also encouraged these farmers to produce quality oriented grapes for both exports as well as wine industries.

Nasik district has been rightly called the grape hub of our country. From Nasik district most of the European countries and the west are getting the required quality of grapes. Now the export agents and the government should encourage more exports by identifying untappable export markets like South-East Asian nations, Gulf countries, Latin American countries and Northern African countries.

---------------------