

GRAPES

1. Introduction

Grape (*Vitis vinifera*) is basically a sub-tropical crop. However, in India, grapes are cultivated for their excellence also under tropical conditions. In India, Grapes are cultivated in an area of 111.4 thousand ha with a total production 1,234.9 thousand tons and productivity of 11.1 tons/ha. Because of special arbour training systems provided for grape cultivation in India, productivity is highest among the grape growing countries of the world.

Maharashtra is a leading state in production of grapes in the whole country. With regard to agricultural land under grape cultivation and grapes production, Nasik and Sangli districts are at forefront in the state. Apart from these, grapes are also grown in the district of Ahmednagar, Pune, Satara, Solapur and Osmanabad. Nowadays, grapes are produced in Latur district of Marathwada also. However, Nasik and Sangli districts are ahead in the production of grapes in a scientific manner.

Area under grapes in Maharashtra is 86 thousand ha and production is around 774 thousand tons of grapes annually. Total export of grapes from India is 108.58 thousand tons during 2011-12 valuing of Rs. 602.88 crores, out of which, nearly 80% is exported from Maharashtra.

World Scenario

According to FAO data (2010), the leading grape producing countries in the world in terms of production are China (8,651.83 thousand tons), Italy (7,787.80 thousand tons), USA (6,777.73 thousand tons) and Spain (6,107.20 thousand tons).

India's high productivity in grape has made it to reach 18th position in the world as far as production (total world production 67,116.25 thousand tons) is concerned.

Major producing countries of grapes in world (2010)

Country	Production (tonnes)	Area (ha)	Yield (Hg/Ha)	%age share of World in Production
China	8651831	533137	134263	12.89
Italy	7787800	777500	59316	11.60
United States of America	6777730	8001	195000	10.10
Spain	6107200	14942	174616	9.10
France	5848960	787133	100997	8.71
Turkey	4255000	19000	15625	6.34
Chile	2755700	188200	162282	4.11
Argentina	2616610	223685	116977	3.90
Iran (Islamic Republic of)	2255670	220836	100165	3.36
Australia	1684350	163785	102839	2.51
Other Countries	18375404	4168293	6575047	27.38
World total	67116255	7104512	7737127	100.00

Source: FAO

Indian Scenario

There is sizeable increase in acreage and production of grapes in India. In acreage, there is an increase from 47.5 thousand ha in 2001-02 to 111.4 thousand ha in 2010-11. Similarly the production has increased from 1,184.2 thousand tons in 2001-02 to 1,234.9 thousand tons in 2010-11. The details are given in table.

Area, production, and productivity of grapes in India

Year	Area (000'ha)	Production (000'tons)	Productivity (tons/ha)
2001-02	47.50	1184.20	24.90
2002-03	52.10	1247.80	24.00
2003-04	57.80	1474.80	25.50
2004-05	60.50	1564.70	25.90
2005-06	66.00	1649.60	25.00
2006-07	65.00	1685.00	25.90
2007-08	68.00	1735.00	25.50
2008-09	80.00	1878.00	23.50
2009-10	106.40	880.70	8.30
2010-11	111.00	1235.00	11.10

Source: National Horticulture Board, Government of India

2. Major producing states with production of last 3 years

Maximum grape production takes place in Maharashtra (774 thousand tons) state followed by southern states like Karnataka (330.3 thousand tons), Tamil Nadu (53 thousand tons) and Andhra Pradesh (27.6 thousand tons). The details are given below in table.

Area in '000' ha; Production in '000' MT; Pdy. (ha/MT)

State	2008-09			2009-10			2010-11		
	Area	Production	Pdy.	Area	Production	Pdy.	Area	Production	Pdy.
Maharashtra	55.7	1415.0	25.4	82.0	440.0	5.4	86.0	774.0	9.0
Karnataka	14.9	269.0	18.0	17.4	317.6	18.3	18.1	330.3	18.3
Tamil Nadu	3.1	91.0	29.8	2.6	44.1	16.8	2.7	53.0	19.3
Andhra Pradesh	3.0	62.2	21.0	1.4	29.8	21.0	1.3	27.6	21.0
Other	3.0	41.1	13.8	2.9	49.2	16.7	3.3	49.69	15.06
Total	79.6	1878.3	23.6	106.4	880.7	8.3	111.4	1234.9	11.0

Source: National Horticulture Board, Government of India

3. Description of commercially grown varieties

Shows the varietal characteristics of commercially grown grapes

Name of the variety	Description	Berry diameter
Thompson Seedless	Berries are oval to oblong in shape with T.S.S.18-22o Brix, acidity 0.5 to 0.7%	16 mm to 18 mm
Sonaka	Berries are elongated, cylindrical and amber coloured,T.S.S. around 22 o Brix,acidity 0.4- 0.7%	16 mm to 19 mm
Sharad Seedless	Berries are oblong to elliptical in shape and bluish black in colour with T.S.S. 18-21 oBrix and acidity 0.5-0.7%	18mm to 22 mm
Tas-e-Ganesh	Berries are ovoid shaped and green to amber in colour with T.S.S. 20-22 o Brix and acidity 0.5- 0.65%	15 mm 20mm

4. Good Agricultural Practices (GAP)

- Selection of improved varieties for cultivation
- Identification of exact nature of problems in difficult soils and providing solutions.
- Adoption of suitable training system and high planting density and canopy management
- Integrated nutrient and water management of vineyards
- Treatment with chemical growth regulants for quality improvement
- Weed management
- Integrated pest and disease management practices

5. Harvesting season of crop

Harvest season of grapes is depicted below (for 12 months)

States	-Lean Period				-Peak Period							
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Maharashtra	Yellow	Green	Green	Yellow	Yellow		Green					Yellow
Karnataka							Green					
Andhra Pradesh	Yellow	Green	Green	Yellow	Yellow							Yellow
Tamil Nadu					Green	Green	Green		Yellow	Yellow	Yellow	Yellow
Punjab												Yellow
Haryana					Green	Green	Green					

Source: Indian Horticulture Database

6. Arrival pattern in the market

Grapes start coming to the market in middle of January and peak time of availability is during February-March. Availability season is extended further to April – May by keeping the produce in cold stores. The details are given below in table:

Details of arrival pattern of grapes in leading states

S.No.	States	Period Of Availability	Peak Season
1	Maharashtra, Karnataka and Andhra Pradesh	Middle of December - May	February-March
2	Tamil Nadu**	Mid of December – Mid of April	February – March
3	Punjab and Haryana	1st week of June to 3rd week of June	Mid June

** Grapes are also available in Tamil Nadu during May to July and September to November months.

7 (a) Concentrated pockets

State	Districts
Maharashtra	Nasik, Sangli, Solapur, Pune, Ahmednagar, Satara, Osmanabad
Karnataka	Belgaum, Bijapur, Bagalkot, Kolar, Bangalore
Tamil Nadu	Theni, Coimbatore, Dindigul, Dharampuri
Punjab	Bhatinda, Ferozpur, Muktsar, Sangrur
Andhra Pradesh	Rangareddy, Mehboobnagar
Haryana	Fatehabad, Sirsa, Hisar

(b) Catchment areas of market

Showing the details of catchment areas of market of grapes in leading states

States	Districts (Market)	Blocks
Maharashtra	Solapur	Karmala, Barsi, Madha, Mohol, Mangalwedha, Sangole, Malsiras, Pandharpur, Akalkot.
	Nashik	Kalvan, Peint, Igatpuri, Sinnar, Niphad, Yeola, Nandgaon, Satana, Furgana, Dindori, Melgaon,
	Sangli	Atpadi, Khanapur, Islampur, Shirala, Valva, Tasgaon, Kavathe, Mahankal, Jath, Miraj
	Ahmednagar	Srirampur, Sangamner, Akola, Rahusi, Nevasa, Parner, Pathardi, Srigonda, Karjat
	Pune	Junnar, Ambegaon, Ghod, Rajgurunagar, Wadgaonsirur, Mulshi, Welhe, Purandhar, Bhor, Baramati, Indapur, Daund, Saswad.
	Satara	Mahabaleshwar, Khandala, Wai, Phaltan, Koregaon, Khata, Patan, Karad, Vadug.
Karnataka	Bijapur	Indi, Sindgi, Basavna Bagevadi, Muddebihal, Tikota.
	Belgaum	Athni, Arkali, Chikodi, Mukeri, Bailhongal, Ramdurg, Khauapur.
	Bagalkot	Jamkhandi, Mudhol, Hungund, Badami.
	Kolar	Bagepalli, Gauribidanur, Gudibanda, Chik Ballapur, Mulbagal, Malur, Bangarapet
	Bangalore	Amekal, Sonnenahalli, Kannur, Bagalur, Nagarur, Marangondahalli, Haralur, Mantapa, Solurur, Chandapur.
Andhra Pradesh	Rangareddy	Marpali, Vikarabad, Tandur, Pargi, Ibranimpatan, Shahabad, Doma, Maisaram, Miryan, Nancherla.
	Mehbubnagar	Kollur, Keshampat, Mughalgidda, Karnul, Wanparti, Atmakur, Gadwall, Alampur, Kolhapur, Achampet, Kondangol.
Tamil Nadu	Theni	Periyakulam, Andipatti, Uttammalayam, Bodimayakkanur, Kamban, Megamali, Vadugapatti,
	Coimbatore	Muttuppalaiyam, Avinashi, Tiruppur, Palladam, Udumallaipettai, Pollachi, Valparai.
	Dindigul	Palani, Kodaikkanal, Oddanchatran, Vedasandur, Naltam, Nilakkotai, Palaiyan
Punjab	Bhatinda	Rampura Phul, Talwani Sabo, Bhagra, Jalal, Nathana, Bandi, Jaisinghwal, Shergarh, Sangat, Malkana, Lahri, Teona.
	Ferozpur	Zira, Fazilla, Abohar, Jalalbad, Fatehgarh, Panjeke, Ladhuka, Lakhawall, Ramsara, Wahabwala.
	Muktsar	Kanianwali, Malaut, Baruwali, Sotha, Doda, Bhadar, AbulKharana, Bhagu, Waring, Khera
Haryana	Fatehabad	Ratiya, Tohana, Badalgarh, Bhattu, Sampla, Pirthala, Samiyana, Kharihajan, Bhattukalan
	Sirsa	Fatehpur, Dabwali, Ellenabad, Banwala, SalamKhera, Nathohar, Mangla, Jamal, Gushalyana.
	Hisar	Bithmara, Adampur, Narnaund, Hansi, Budak, Mangal, Umra, Sultanpur, Babal, Baria, Agroha, Kanoh, Khedar, Budak.

8 Criteria and description of grades

According to Agmark standards grapes are classified into following classes:

Table below Showing criteria for grade designation as per **AGMARK** standards

Grade designation	Grade requirements	Provision concerning sizing	Grade tolerances
1	2	3	4
Extra class	Grapes must be of superior quality. The bunches must be typical of variety in shape, development and coloring and have no defects. Berries must be firm, firmly attached to the stalk, evenly spaced along the stalk and have their bloom virtually intact.	As per table 'A'	5% by weight of bunches not satisfying the requirements of the grade, but meeting those of class I grade or exceptionally coming within the tolerances of that grade.
Class I	Grapes must be of good quality. The bunches must be typical of variety in shape, development and coloring. Berries must be firm, firmly attached to the stalk and, as far as possible, have their bloom intact. They may, however, be less evenly spaced along the stalk than in the extra class. Following slight defects may be there, providing these do not affect the general appearance of the produce and keeping quality of the package. - a slight defect in shape. - a slight defect in coloring	-do-	10% by weight of bunches not satisfying the requirements of the grade, but meeting those of class II grade or exceptionally coming within the tolerance of that grade.
Class II	The bunches may show defects in shape, development and coloring provided these do not impair the essential characteristics of the variety. The berries must be sufficiently firm and sufficiently attached. They may be less evenly spaced along the stalk than Class I grade. Following defects may be there, provided these do not affect the general appearance of the produce and keeping quality of the package. - defects in shape - defects in coloring - slight sun scorch affecting the skin only, - slight bruising, - slight skin defects	-do-	10% by weight of bunches not satisfying the requirements of the grade, but meeting the minimum requirements.

Size is determined by the weight of bunches (in gms). The following minimum (in gms) requirements per bunch are laid down for large and small berries grapes.

Provision concerning size

Specification details of Corrugated Fibre Board boxes are given in the following table.

Grade	Large berries	Small berries
Extra class	200	150
Class I	150	100
Class II	100	75

Size tolerance:

Extra Class, Class I, Class II: 10% by weight of bunches not satisfying the size requirements for the grade, but meeting the size requirements for the grade immediately below.

9 Packaging and its details

(A) For exports:

Packaging is normally done in Corrugated or Solid Fibre board cartons. A layer of double pad or protective liner is placed at the bottom of the carton to protect the grapes from bruising and a polyethylene lining is placed over it. The detailed specifications are given below in table 3.10 and table.

Specification details for Corrugated Fiber Board (CFB) Boxes for packing (2Kg box) {Dimension: 270X150X100 mm}

S.No.	Specification	Slide Type	Ring *Flap Tuck-In-Type	RSC(REGULAR SLOTTED CONTAINER)	Tray with LID
1	Material for construction	3-ply CFB	3-ply CFB	3-ply CFB	3-ply CFB
2	Grammage (g/m sq.)(outer to inner)	*230X140X140	*230X140X140	*230X140X140	*230X140X140
3	Bursting strength kg/cm sq.	Min. 6.00	Min. 6.00	Min. 6.00	Min. 6.00
4	Puncture resistance inches/teat inch	Min.10.00	Min.10.00	Min.10.00	Min.10.00
5	Compression strength Kg.	Min.225	Min.225	Min.225	Min.225
6	Cobb (30 minutes g/m sq.)	Min.130	Min.130	Min.130	Min.130

Source: Post- Harvest Manual for Export of Grapes, APEDA, New Delhi.

Specification details for Corrugated Fiber Board (CFB) Boxes for packing(5 Kg Box) {Dimension: 480X300X100 mm}

S.No.	Specification	Slide Type	Ring *Flap Tuck-In-Type	RSC(REGULAR SLOTTED)	Tray with LID
1	Material for construction	5-ply CFB	5-ply CFB	5-ply CFB	5-ply CFB
2	Grammage (g/m sq.)(outer to inner)	*230X140X140X140	*230X140 X140X140	*230X140 X140X140	*230X140X140X140
3	Bursting strength kg/cm sq.	Min. 10.00	Min. 10.00	Min..250	Min..250
4	Puncture resistance inches/teat inch	Min..250	Min..250	Min..250	Min..250
5	Compression strength Kg	Min.350	Min.350	Min.350	Min.350
6	Cobb (30 minutes g/m sq.)	Max.130	Max.130	Max.130	Max.130

*Outer ply of white duplex board

Source: Post- Harvest Manual for Export of Grapes, APEDA, New Delhi.

(B) For domestic markets:

For domestic markets also, grapes are packed in Corrugated Fibre Board boxes.

10 Distribution of produce from primary to terminal market

- Grapes grown in different parts of country are transported to the big cities for marketing.
- The fruits produced in Maharashtra, Karnataka, Andhra Pradesh and Tamil Nadu find market in Mumbai, Nagpur and Kolkata.
- The important whole sale markets of grapes in India are Kolkata, Delhi, Mumbai, Chennai, Bangalore, Nagpur, Pune and Ahmedabad. Grapes for these big arkets are usually collected at the central places in all grapes growing areas.
- From Mumbai port grapes are exported to the destination markets.

11 Export and export potential

A. Domestic strengths for exports of grapes

Domestic strengths for exporting grapes are enumerated in following paragraphs:

- Grapes in India are mainly cultivated in tropical region of the country 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.
- Farmers of different regions have organized themselves by forming association/cooperatives 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 packhouses 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 mporting 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.

B. Exports

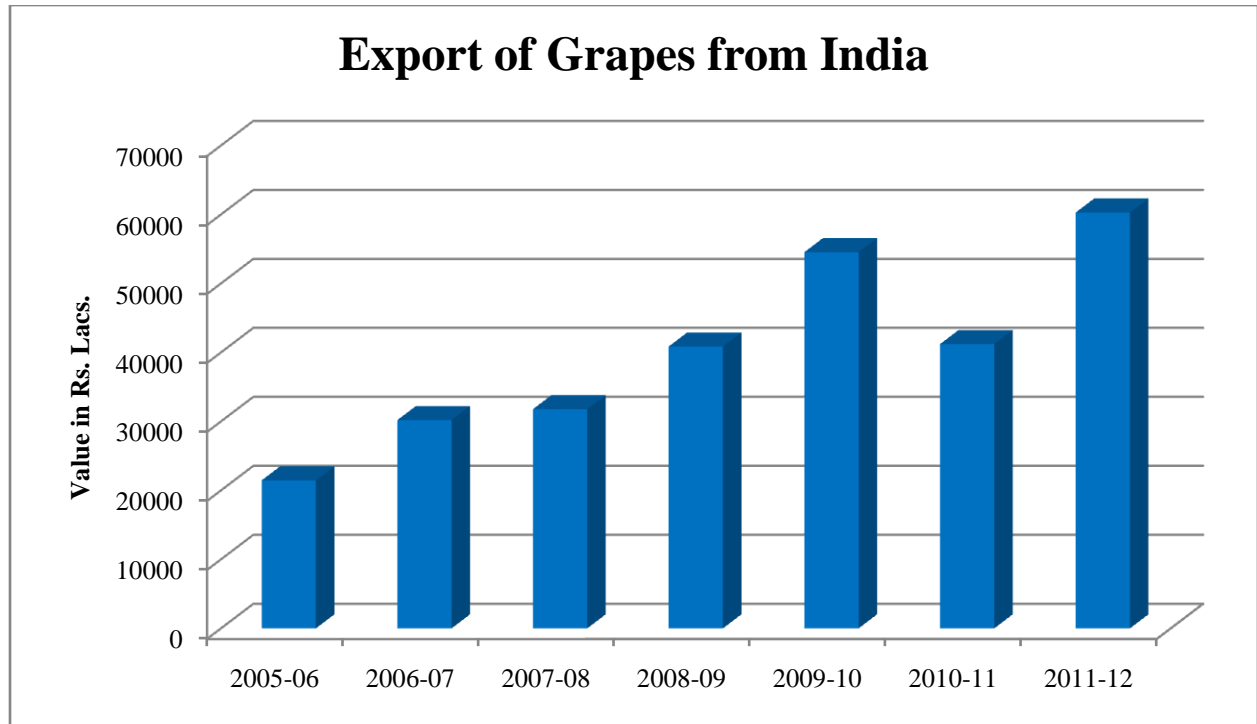
There is a phenomenal rise in export of grapes from India, as only 54,049.87 tons were exported during 2005-2006 which has increased to 108584.56tons in 2011-2012.(APEDA database). Increase has been observed mainly in the last 5-6 years, because of the fact that India is meeting quality requirements including pesticide residues of all the importing countries in EU and supplying grapes at competitive prices.

Exports of grapes from India

Qty in MT, Value in Lacs		
Year	Qty.	Value
2005-06	54049.87	21460.85
2006-07	85897.79	30192.45
2007-08	96963.57	31782.51
2008-09	124627.97	40861.28
2009-10	131153.61	54533.89
2010-11	99311.83	41206.32
2011-12	108584.56	60288.15

Source: APEDA Database, 2011-12

Export of Grapes from India

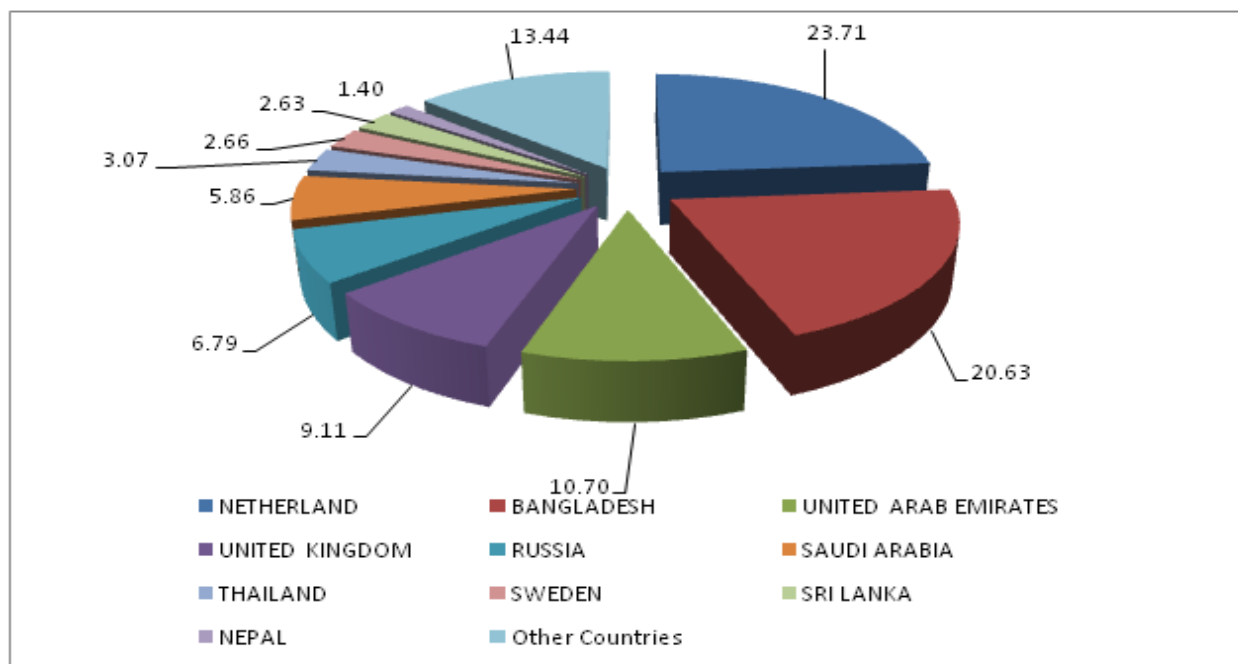


India is the major exporter of Grapes in the world, the country has exported 108584.56 MT of Fresh Grapes worth Rs. 60288.15 Lacs during the year 2011-12. The major destinations of India's grapes were Netherland , Bangladesh, UAE, U.K, Russia and Sudi Arbia respectively. These countries have imported more than 50 per cent of India's grapes during 2010.

The detail of the major importing countries of India's Grapes is given below:

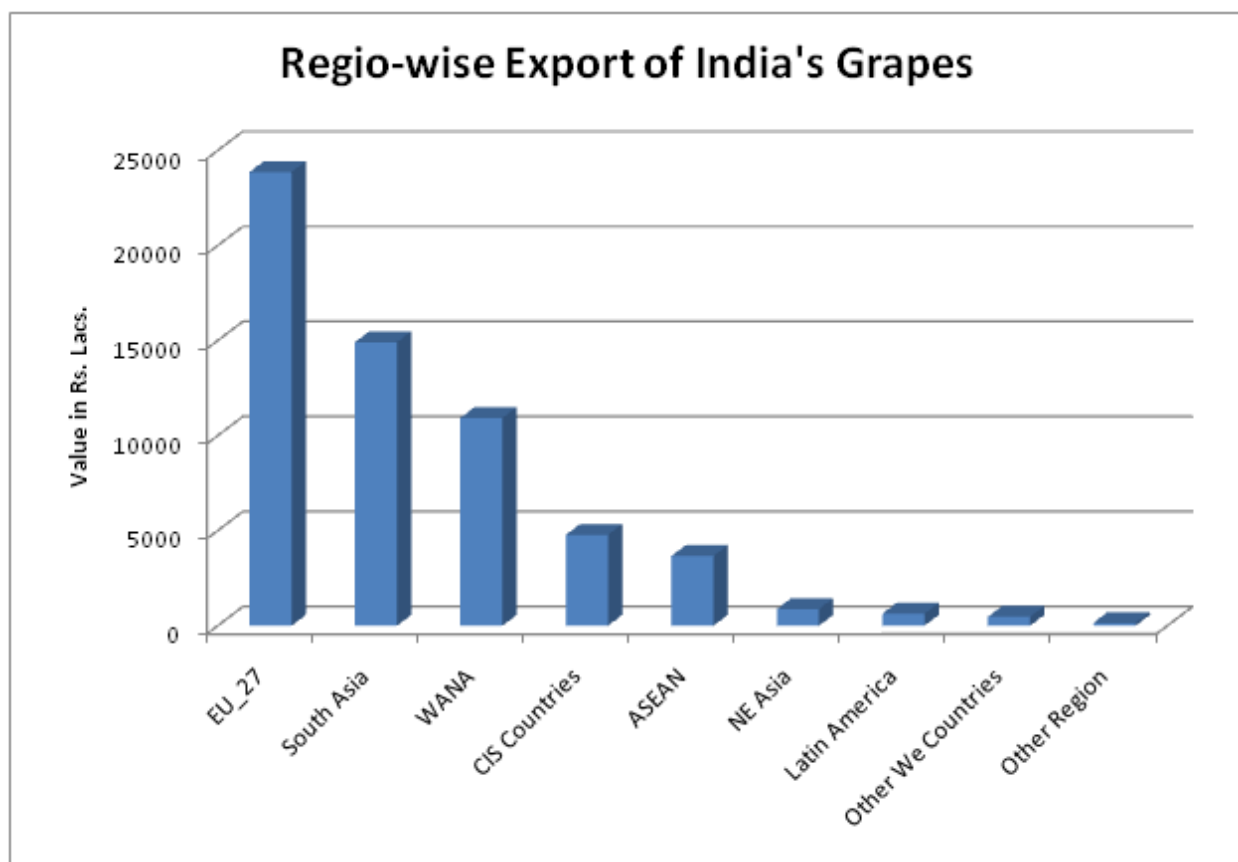
Major Importing countries of India's Grapes								
Country	Qty in MT, Value in Lacs							
	2009-10		2010-11		2011-12		%age growth	Share in %age
	Qty	Value	Qty	Value	Qty	Value		
Netherland	29074.40	16883.63	17700.20	11809.86	18511.46	14296.52	21.06	23.71
Bangladesh	45656.02	6275.73	38562.78	5495.93	39646.54	12440.29	126.35	20.63
UA E	13205.45	7285.65	10384.29	5331.84	10359.26	6448.44	20.94	10.70
United Kingdom	14359.53	8210.77	7749.39	4847.62	6841.01	5490.48	13.26	9.11
Russia	745.81	598.24	2548.46	1934.86	4936.60	4092.24	111.50	6.79
Saudi Arabia	5098.85	2725.91	4058.26	1768.87	5735.26	3531.10	99.62	5.86
Thailand	875.64	741.16	1451.52	1335.54	1807.15	1850.94	38.59	3.07
Sweden	276.68	145.16	932.27	620.87	2196.27	1604.20	158.38	2.66
Sri Lanka	1506.50	461.53	1472.85	469.73	2171.38	1584.16	237.25	2.63
Nepal	4499.04	506.42	4435.74	492.06	4712.94	846.45	72.02	1.40
Other countries	15855.72	10699.66	10016.08	7099.15	11666.71	8103.35	-852.67	13.44
Total	131153.64	54533.86	99311.84	41206.33	108584.58	60288.17	46.31	100.00

Source: DGCIS



Region-wise Export of India's Grapes						
Quantity in MT; Value in Rs.Lacs						
Region Name	2009-10		2010-11		2011-12	
	Quantity	Value	Quantity	Value	Quantity	Value
EU_27	51669.01	29490.62	30284.62	19999.35	32122.43	23864.08
South Asia	51674.93	7254.63	44472.90	6459.67	46589.45	14911.46
WANA	23277.61	14298.76	15919.09	8141.32	17584.28	10934.24
CIS Countries	921.62	706.96	3275.38	2397.24	5930.93	4783.08
ASEAN	2121.60	1679.32	3112.51	2632.84	3621.89	3667.15
NE Asia	175.59	122.95	929.96	716.55	1053.59	878.18
Latin America	192.07	191.23	166.93	83.61	885.71	630.82
Other We Countries	799.36	600.91	666.93	565.01	582.35	468.52
East Africa	186.01	126.98	178.22	106.07	168.52	112.07
East Europe	36.00	23.43	18.00	11.91	20.00	15.62
East Asia	18.20	8.22	30.03	8.04	11.37	10.11
North America	9.58	6.32	96.55	43.36	6.67	6.55
West Africa	23.19	13.35	122.85	29.05	6.33	5.45
Southern Africa	1.16	0.84	4.25	3.24	0.94	0.74
Central Africa	0.00	0.00	0.30	0.15	0.12	0.07
UNSPECIFIED	47.68	9.36	33.30	8.90	0.00	0.00
Total	131153.61	54533.88	99311.82	41206.31	108584.58	60288.14

Source: DGCIS Annual Export



i) European Union

Exports of grapes from India are maximum to European Union during 2011-2012. As much as 32,122 tons were exported during the year. Largest importers were Netherlands (18,511 tons) and UK (6,841 tons). It must be noted that India produces grapes mainly during January to April months, where as countries like U.S.A, Argentina, Italy, Spain etc. produce grapes during September to December months. 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.

ii) South Asia

South Asia stood at second position with the import of 46589 MT Grapes from India during 2011-12. The major market of India's Grapes in South Asia region were Bangladesh, Sri Lanka and Nepal with 39646 MT, 2171 MT and 4743 MT respectively during the period.

iii) WANA Countries

As per DGCIS database, nearly, 17584 tons of India's Grapes were exported to WANA Region of the world during 2011-12. The major market of India's Grapes in WANA region was UAE and Saudi Arabia with 10359 tons and 5735 tons respectively, during the period.

The major competition of India Grapes export in WANA countries was South Africa and Chile. There is no reason why we cannot penetrate more in WANA 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 WANA countries.

12. Storage

Temperature:	$0 \pm 0.5^{\circ}\text{C}.$
Relative Humidity:.	$93 \pm 2 \%$
Storage Period:.	3-8 weeks
Freezing Point:.	$-1^{\circ}\text{C}.$

13. Documents required for exports

a).Documents related to goods

- Invoice
- Packing List
- Certificate of origin

b).Documents related to shipment

- Mate Receipt
- Shipping Bill
- Bill of handing
- Airway Bill

c) Documents related to Payment

- Letter of Credit (L/C)
- Bill of Exchange

d) Documents related to quality of goods

- Phytosanitary Certificate
- GLOBALGAP Certification
- Health Certificate

e) Organic Certification

Certificate indicating material produce is based on organic farming

f) Documents related to Foreign Exchange Regulations

GR Form: Documents required by RBI which assures to RBI that the exporter will realize the proceeds of goods within 180 days from the date of Shipment.

g) Other Document

Bank Realization Certification (BRC): This is the advice given by Foreign Exchange Bank after the realization of money from Importer.

14. Chain of events which happen up to shipment

Process flow chart in pack house

- Receipt of raw material at pack house
- Weighment and acceptance of produce
- Trimming, sorting and grading
- Weighment
- Packing and coding
- Pre-cooling
- Sulphur dioxide padding
- Palletization
- Storage (cold stores)
- Container loading
- Transportation