

PROSPECT OF GRAPEVINE CULTIVATION IN INDIA

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Abstract

In the present paper, an attempt has been made to study the prospect of grapevine cultivation in India. Grape is one of the most important commercially fruit crops of the world. Grapevine is a perennial long-lived plant; it is a tropical, sub-tropical fruit and can be grown in a wide range of climatic condition. India is the 9th largest grape producing country in the world with the production of 2689910 tones, which make a share of 3.88 per cent of total production of grape in the world. The country has the distinction of achieving the highest productivity of grape among the 91 grape growing countries in the world, with an average yield of 25 to 30 tons per hectare. The present paper attempts to study the prospect of grapevine cultivation about Area under Grape cultivation, production and productivity of India.

Keywords: Grapevine cultivation, Area, production, productivity and consumption pattern.

Introduction

Grape is one of the most commercially important fruit crops of the world. Among all of the fruits, grapes occupy first position in terms of area and production in the world. Grape is one of the first fruits to be cultivated by man (McGovern et al. 1995). It is a tropical and sub-tropical fruit and can be grown in a wide range of climatic condition. There are more than 1 000 different varieties of grapes found all over the world. Grapes belong to the Vitaceae family. Grape is called queen of fruits'. Grapes are small round or oval berries that feature semi-translucent flesh encased by a smooth skin. Some contain edible seeds while others are seedless. Like blueberries, grapes are often covered by a protective, whitish bloom. It is one of the most delicious, refreshing and nourishing fruits of the world. It is fairly good source of minerals like calcium, phosphorus and iron and vitamins like B1 and B2. Grape is produced in over 91 Countries worldwide (APEDA). China and Italy stood at first and second position among grape producing countries in the world. At present India is 9th position among grapes growing countries of the world (Shikamany, 2001; Ramanan, 2012; Gade et.al, 2014)). In India, remarkable success has been achieved in table grape production and yield levels of fresh grapes are among the highest in

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the world. The country has the distinction of achieving the highest productivity of grape in the world, with an average yield of 25 to 30 tonnes per hectare (APEDA). The present paper attempts to study the prospect of grapevine cultivation in India.

Objectives

The present study was undertaken with the following objectives

1. To study the perspective of Grapevine Cultivation in India.
2. To study the growth rate of area, production, and productivity of grapes in India.
- 3.

Data Base and Methodology

The present study is based on secondary data. The data relating to the area under grapevine crops has been taken from the National Horticulture Board; Government of India. Appropriate statistical technique has been used for analyzing the data. The period 2001-02 to 2012-13 is considered for present investigation. The collected data processed and presented with the help of cartographic techniques.

GRAPE CULTIVATION IN INDIA

Grape cultivation is one of the most remunerative farming enterprises in India. In India, grape is presently cultivated over an area of 250 thousand hectares. In India about 78 per cent of the total production of grapes is used for fresh consumption (table fruit), about 17 to 20 per cent are used to produce raisin and 1 to 2 per cent used for the wine making.

History of Grape Cultivation in India

Grape was introduced into India in 1300 AD by the Persian invaders and from there spread to rest of the country. Hiuen Tsiang the Chinese Buddhist pilgrim, who came to India in 629 A. D. noted plantation of grapes and other fruits on different part of India (Phule, 2002). Kautilya in his 'Arthashastra' written in the 4th BC mentioned the type of land suitable for grape cultivation. During the historic event of changing the capital from Delhi to Daulatabad by Mohammad- Bin-Tughlak, grape were introduced the South in the 14th century. Ibn Batuta (1430) a Moorish traveler is reported to have seen well maintained vineyards in India. As a result in the 17th century, viticulture reached its peak in the Deccan during the regime of Aurangzeb, with the fall of Mogal empire viticulture in North entered into Deccan phase. In 1832, a French priest at Melpatti and Michaelputti villages introduced grapes into Madras. It was introduced into Mysore and Salem and Madurai districts of Tamil Nadu during the same period (Todkari, 2012). Since this period grape culture became more popular in South India. The Bijapur and Ahmednagar kings about the year 1550 gave liberal grants. Under the patronage of Pesewa of Pune the industry flourished in Maratha Empire for hundred years from 1717 to 1817. After that the grape cultivation spread to different parts of the country. Systematic grape cultivation was initiated during the middle of the 20th century. Since grapes is commercially cultivated in India.

Grape Regions in India

The grapes are cultivated mainly from sub tropical region of the world due to warm climate. The viticulture can also be practiced in tropical region by selecting suitable cultivars and adopting proper cultural trends of grape production. However, viticulture is greatly possible between

latitudes of 20° to 50° North and 20° to 40° South (Sathe, 2010). India is gifted with advantages like soil variation and different types of climate. Hence, it harvests a variety of fruits around the year. Different fruits can be grown successfully in temperate, subtropical and tropical zones. This heterogeneous climatic condition has formed three major grape cultivation zones as (Singh et. al, 1967; Patil, 1978) which are follows.

➤ **Temperate and sub- tropical region**

This region covers the northwestern plains corresponding to 28° N and 32° N latitude including Delhi; Meerut district of Uttar Pradesh; Hissar and Jind districts of Haryana; and Bhatinda, Ferozpur, Gurdaspur and Ludhiana districts of Punjab. The soils are alluvial with high water holding capacity. Vines undergo dormancy and bud break starts in the first week of March while the rains arrive in the first week of June, and therefore, only 90-95 days are available from the initiation of growth to harvest. It has variation in climatic condition. Mild winter, dry and hot summer, medium sunlight and low rainfall are the characteristics of this zone and are suitable for grapevine cultivation. Single pruning and a single harvest is the accepted practice here. Late season varieties like Thompson Seedless are not successful in these regions due to its susceptibility to berry cracking and rotting during the rainy season. Rain damage is a problem with Thompson Seedless in this region. Single pruning and single cropping is practiced in this region. Early season varieties such as Perlette and Beauty Seedless were popular in this region but their quality and keeping ability left much to be desired. Hence, early season varieties such as Flame Seedless with better characteristics are becoming popular in this region.

➤ **Hot tropical region**

This region covers Nashik, Sangli, Solapur, Pune, Satara, Latur and Osmanabad districts of Maharashtra; Hyderabad, Ranga Reddy, Mahbubnagar, Anantapur and Medak districts of Andhra Pradesh; and Bijapur, Bagalkot, Belgaum, Gulberga districts of northern Karnataka lying between 15° and 20° North latitude. This is the major grape growing region accounting for 80 per cent of the area under grapes in the country. Vines do not undergo dormancy and double pruning and a single harvest is the general practice in this region. Maximum temperature goes beyond 42° C during summer and minimum temperature is around 8° C in some locations during winter. The major problems in this region are soil and water salinity and drought. Berry growth is impaired and in certain locations pink blush sometimes develops on green berries due to temperatures that drop to a low of 8° C. Thompson Seedless and its clones (Tas-A-Ganesh, Sonaka), Anab-e-Shahi, Sharad Seedless and Flame Seedless are the varieties grown in this region. Red Globe and Crimson Seedless are the commercial cultivars grown in this region with more than 90 per cent of area under Thompson Seedless and its clones. Due to the increasing demand of wine industry, wine varieties like Cabernet sauvignon, Chardonnay, Merlot, Shiraz and Sauvignon Blanc are being grafted in larger areas. Thompson Seedless grown in this region is highly susceptible to downy and powdery mildews.

➤ **Mild tropical region**

An area covered by 10° N and 15° N latitude including Bangalore and Kolar districts of Karnataka; Chittoor district of Andhra Pradesh and Coimbatore, Madurai and Theni districts of Tamil Nadu corresponding to 10° N and 15° N latitude. Maximum temperature in this region

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does not exceed 36° C with high humidity, while the minimum temperature is about 12° C. The incidence of grape disease is a major issue in this region. This was once the traditional area for juice grape cultivars such as Isabella and Muscat Hamburg. Principal varieties are Bangalore Blue (Syn. Isabella), Anab-e-Shahi, Gulabi (Syn. Muscat Hamburg), and Bhokri. Thompson Seedless is grown only with limited success. Except for Thompson Seedless, two crops are harvested in a year. *Vinifera* varieties susceptible to mildew suffer losses due to unprecedented rains during flowering and fruit set in both hot and mild tropical regions. Viticulture is also practiced in other states of our country such as Madhya Pradesh, Rajasthan, and Himachal Pradesh, Jammu and Kashmir. In recent days almost every State of our country is involved in new planting except few humid and north east regions.

Harvesting Season of Grape in India

The harvesting season of major grapes producing areas in India is differs considerably. Different harvesting seasons of grapes in India, details is given below. Overall harvesting start from mid December and last up to June. Grapes are coming in to the market middle of January and peak time of availability is during February -March. However, harvesting of grapes can be advanced or postponed for about 10 to 15 days depending on the market situation. Availability season is extended further to April -May by keeping the produced grapes in cold stores.

Table No 1: Harvesting Season of Grape in India

Sr, No	State	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 3 rd week of June	Mid June

Source: NGRC, Pune

Area, production, and productivity of grapes in India

Table No 2: Area, production, and productivity of grapes in India

Year	Area (000'ha)	Growth rate (%)	Production (000'ton)	Growth rate (%)	Productivity (tons/ha)	Growth rate (%)
2001-02	47.50	00	1184.20	00	24.90	00
2002-03	52.10	09.68	1247.80	05.37	24.00	-3.61`
2003-04	57.80	10.94	1474.80	18.91	25.50	6.25
2004-05	60.50	04.67	1564.70	06.09	25.90	1.56
2005-06	66.00	09.09	1649.60	05.42	25.00	-3.40
2006-07	65.00	-1.51	1685.00	02.14	25.90	3.60
2007-08	68.00	04.61	1735.00	02.97	25.50	-1.54
2008-09	80.00	17.64	1878.00	08.24	23.50	-7.84
2009-10	106.40	33.00	880.70	-53.10	8.30	-64.68
2010-11	111.00	04.32	1235.00	40.22	11.10	33.34
2011-12	116.40	04.86	2220.00	79.75	19.13	72.34
2012-13	250.00	114.00	2689.91	21.16	10.75	-43.80

CAGR	17.40	--	135.88	--	-2.28	--
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Source: National Horticulture Board, Government of India.

In India, grape is presently cultivated over an area of 250 thousand hectares, which make 0.33 per cent to total area of harvest in the world. India occupies 9th position among grapes growing countries of the world. The country has exported 172,744.41 MT of Grapes to the world for the worth of Rs. 1,259.40 carores during the year 2012-13. Table no 2 shows the area production and productivity of grapes during the 2001-02 to 2012-13. The area under grape is increased from 47.50 thousand hector to 250 thousand hector during 2001-02 to 2012-13. The compound annual growth rate of the area under grape production was 17.40 per cent. In addition, the production of grape has also increased by 135.88 percent during the considered period in India. However, the productivity of grape has been decreasing by 2.28 per annum. In order to increase production of grapes cultivators are using fertilizers, pesticides, and water in irrational manner because of that we found decreasing trend in productivity of land in terms of grapes production.

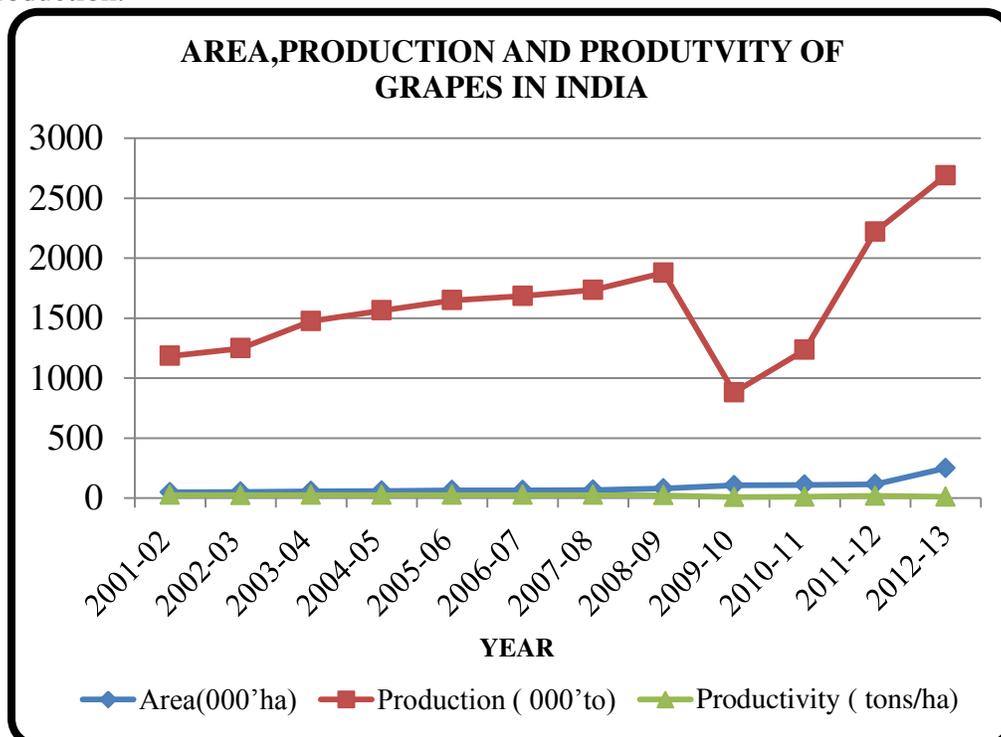


Fig.1

Important Verities of Grapes Grown in India

More than 20 varieties are under cultivation in India However; only a dozen are commercially grown. Major grape-growing states are Maharashtra, Karnataka, Andhra Pradesh, Tamil Nadu, and the north-western region covering Punjab, Haryana, western Uttar Pradesh, Rajasthan and Madhya Pradesh. Maharashtra ranks first in terms of production accounting more than 75 per cent of total production and highest productivity in the country.

Table No 3: Grapes varieties cultivated in different region of India.

Region	State	Verities	District involved in cultivation
Region-I	Delhi	Perlette, Anab-e-Shahi, Kali Sahib, Thompson	Delhi
	Haryana	Perlette, Anab-e-Shahi, Red globe, A 17-3, Kishmish	Hissar, Gurgaon etc.
	Panjab	Perlette, Anab-e-Shahi.	Ludhina, Jullundar, Ferozpur
	Uttar Pradesh	Perlette, Anab-e-Shahi, Kali Sahib, Thompson.	Agra, Meerut, Muzaffarpur
	Rajasthan	Anab-e-Shahi, Sharad , Perlette.	
Region-II	Karnataka	Thompson , Bangalore Blue , Anab-e-Shahi, Dilkhush,Sharad, Crimosn Merlo, Flame seedless ,Shiraz cabernet sauvignon, Red globe, Sultanine -II, A 17-3, Kishmish	Bijapur, Balgaum Kolar, Bellary, Mysore Raichur, Shimoga, Tumkur Dharwar, Gulbarga, Bagalkot, etc.
	Maharashtra	Thompson, Kali Sahebi, Sharad seedless, Tas-A-Ganesh, H-5, Sonaka , Clone-2, Red globe, Shiraz cabernet Sauvignon, Sultanine-II,A 17-3, Crimosn , Chardonnay, Merlot.	Sangli, Satara, Pune, Nashik, Solapur, Ahmadnager, Latur Osmanabad ,Aurangabad etc.
	Madhya Pradesh	Thompson, Sonaka, Chirah Sharad seedless ,Tas-A-Ganesh.	Indore, Ratlam, Khandwa.
Region-III	Tamilnadu	Thompson, Sharad, Bhokri seedless, Crimosn , Gulabi, Muscat, Anab-e-Shahi, Sonaka, Bangalore blue.	Coimbatore, Madhurai, Dhaempuri, Theriv etc.

Source: National Horticulture Board, Government of India.

Major Grapes producing states in India

Grape is grown almost in all the states of India. Major grape-growing states are Maharashtra, Karnataka, Andhra Pradesh, Tamil Nadu, and the north-western region covering Punjab, Haryana, western Uttar Pradesh, Rajasthan, Chhattisgarh, Nagaland, and Madhya Pradesh. Maharashtra ranks first in terms of production accounting for more than 75 per cent of total production and highest productivity in the country. Maharashtra is the leading grapes producing state with production of 1810 thousand tons in the year 2011-12 followed by Karnataka state which has produced of 288.10 thousand tons. The grape production of Tamilnadu is 55.1 thousand tons, followed by Andhra Pradesh and Mizoram i.e. 28.9 and 24.3 thousand tons respectively.

Table No 4 : Area, Production and Productivity of leading grape growing states in India

State	Area (000 ha)				Production (000 tons)				Productivity			
	2009-10	2010-11	2011-12	2012-13	2009-10	2010-11	2011-12	2012-13	2009-10	2010-11	2011-12	2012-13
Maharashtra	82	86	92	82	440	774	1810	2050	5.36	9.00	19.67	25
Karnataka	17.4	18.1	16.80	17.4	317.6	330.3	288.10	320.90	18.25	18.24	17.14	18.44
Tamilnadu	2.6	2.7	2.9	2.6	44.1	53.0	55.1	16.48	16.53	19.62	19	6.33
A.P.	1.4	1.3	1.4	1.4	29.8	27.6	28.9	32.75	21.28	21.23	20.64	14.74
Mizoram	NA	1.6	1.9	1.2	18.40	20.4	24.3	20.80	NA	12.75	12.78	10.65
Others	2.9	1.7	1.00	1.7	49.2	29.5	14.5	17.07	16.95	17.35	14.5	10.04
Total	106.4	111.4	116.0	106.3	880.7	1234.9	2220.9	2458.40	8.27	11.08	19.14	23.12

Source: National Horticulture Board, Government of India

The table 4 shows that the area under grape cultivation in all the state is almost constant over a period of 2009-10 to 2012-13. However, in terms of compound annual growth rate of area under grape cultivation is nearly 1 per cent decrease per annum. It has been seen from the data that the production of grapes has increased tremendously during 2009-10 to 2012 13 (i.e 535.66) only in the state of Maharashtra. On the other side, the remaining states are lagging behind in the production of grape. It is also interesting to note that the area under grape production in Maharashtra is constant and there is rapid growth in the production of grape, it is because of 5-fold (i.e. highest compound growth rate of productivity is 365.90 per cent in Maharashtra). The productivity of grape increased (percent rapidly due to the use of intensive modern agriculture technology, and favorable climate conditions in Maharashtra. On the contrary, we found decreasing trend in per hectare grape productivity in other remaining states.

Conclusion

Grapevine cultivation is largely controlled by the physic-economic conditions prevailing in country. India occupies 9th position among the area under grapes, 13th in grape production of the world. In 2012-13, Grape is grown over an area of 250 thousand hectare with an annual production of 2.6 million tons in India. In India about 78 per cent of the total production of grapes is used for fresh consumption (table fruit), about 17 to 20 per cent are used to produce raisin and 1 to 2 per cent used for the wine making. Maharashtra is the leading grapes producing state with production of 2050 thousand tons in the year 2012-13. The area under grape is increased from 47.50 thousand hector to 250 thousand hector during 2001-02 to 2012-13. The growth rate of the area under grape, production and productivity are 17.40, 135.88 and -2.28 per cent per annum respectively.

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