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A Survey on Indian Grapes at Sangli, Maharashtra, India

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ABSTRACT

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Grapes (*Vitis vinifera*) are a wonderful subtropical fruit having exceptional pulp content, vibrant color and exert an immense health benefits. It contains considerable amount of phyto-chemicals which reduces the development of chronic diseases. An attempt was made to feed the world by 2050 with best quality Indian grapes. In this study, Sangli scored one of the highest grape producing districts in Maharashtra. Production parameters revealed that 80% of total production in Maharashtra is exported to European Countries and Canada. In the present study, focus has been given on increasing productivity as well as the tonnages of export of best quality grapes, so that it can play an important role in feeding the world with Indian table grapes according to consumer's demand worldwide by 2050.

Introduction

Grapes (*Vitis vinifera*) are one of the most consumed fruit crop worldwide. India ranks 9th position in grape production (Shikamany, 2001; Gade *et al.*, 2014). The grapes (*Vitis vinifera*) are one of the most important crops in India. They are generally grown in the subtropical regions of India. Grapes are cultivated in an area of 111.4 thousand hector with a total production 1,234.9 thousand tons in India (Shinde, 2016). 60 percent of total area of Maharashtra is used for grape cultivation. 30 percent of total area in Sangli is under grape cultivation. They can be used in different forms such as raisins, jam, jelly, beverages like juice, wine. Due to its immense potential in improving human's

immune system, their demand is increasing day by day throughout the world (Sindhu and Radhai Sri, 2015). Grapes are good source of phyto-chemicals which reduces the risk of chronic diseases, such as certain types of cancer and cardiovascular diseases.

According to, *in vitro* and *in vivo* studies grapes have strong antioxidant activity, inhibiting cancer cell proliferation and suppressing platelet aggregation, and also lower down cholesterol. Grapes contain a variety of phyto-chemicals, like phenolic acids, stilbenes, anthocyanins, and proanthocyanidins, all of which act as strong antioxidants (Yang *et al.*, 2013).

Outlook for grape consumption

The demand for consumption of table grapes has been increased in last few decades. In U.S., the consumption of table grapes has also been increased from 1970 to 2003. The increased rate of consumption ranges from 2.9 pounds per capita in 1970 to 7.5 pounds in 2003 (Boriss *et al.*, 2006). China's grape consumption has been increased up to 10 percent. It has been surveyed that china's grape consumption is valued for 198 grams per day. Though China is one of the largest grape producing countries, it imports grapes to feed the consumer from other countries (Frederick *et al.*, 2015).

Feed the world by 2050

The increase in productivity of Indian grapes can feed the world by 2050. In India, Maharashtra is one of the largest grapes producing state with an annual productivity of 774000 tons in 2015. Other major producing states are Karnataka, Tamil Nadu and Andhra Pradesh with an annual production of 330.3, 53 and 27.6 thousand tons respectively. According to a new UN DESA report, it has been revealed that the world population will be reached from 7.3 billion to 8.5 billion by 2030 and to 9.7 billion in 2050 (World Population Prospects: The 2015 Revision). The grape cultivation needs high investment right from the establishment of new vineyard. For successful cultivation of grapes with sustained quality and productivity, a great deal of technical information is needed. Europe consumes table grapes throughout the year. It imports grapes from different countries. But, India exports table grapes in the season Feb-March only which became an important factor. In India, thus, grape sector require more establishment and improvement in the following sectors which includes grape growers, wineries, and supporting industries like cold storages, cool chain transport

systems, packaging industry, various input manufacturers and suppliers of agrochemicals, irrigation and trellises systems, local marketers and exporters to fulfill the objective (National Research Centre for Grapes, 2013). The viticulture can be increased by development from ground level. By increasing productivity implementing new technologies for viticulture, vineyard growth and using new growth promoters, world can be fed by 2050.

Materials and Methods

Grape production and export from India was started from 1991 with an initiation of economic liberalization. The survey closely observed the condition of grape production and consumption. It has been also checked whether these condition were being helpful to fulfill the objective: Feed the world 2050. The survey on observing several aspects of Indian grapes was carried out at Sangli, Maharashtra. The parameter which was checked at this region based on productivity and quality assessments and how it can be helpful to feed the world by 2050. The data were statistically analyzed (Snedecor and Cochran, 1967).

Productivity

The major grape producing countries are China, France, and Italy. The crop ranks fifth in India on the basis of agricultural productivity. 80% of total production of grapes in India comes from Maharashtra followed by Karnataka and Tamil Nadu. It is mainly grown for wine making, raisin making and for consumption as a fresh table grapes throughout the world. India as well as Maharashtra (Nasik, Sangli, Ahmednagar, Pune, Satara, Solapur and Osmanabad Districts) produces mainly table grapes for consuming as a fresh fruit (National Horticulture Board, 2001-02). Average

Productivity of these states of the year 2014-15 is as follows:

- a) Maharashtra (774 thousand tons)
- b) Karnataka (330.3 thousand tons)
- c) Tamil Nadu (53 thousand tons)
- d) Andhra Pradesh (27.6 thousand tons)

Sangli is also one of the largest Grape growing regions in Maharashtra. Agricultural activity is one of the most important means at Sangli. Among all the agricultural production, grape production is one of the important activity. The district rank top position in grape cultivation. 30 percent of total area of production is under grape cultivation (Gaikwad, 2005). Area of grape cultivation at Sangli is also increased in last 2 years which has a greater influence in increasing productivity as well as export. During 1995-96 and 1996-97, area under grapevine cultivation was 4,025 and 4425 hectares respectively with a total production of grapes of 91,980 tons in 1995-96 (Gade and Gaikwad, 2013).Whereas, the productivity increased up to 502.55 tons in 2016-17.

Result and Discussions

Monthly productivity and export

The grape season at Sangli, Maharashtra started from January to March. The tonnage of material increases with the seasons goes on. In 2017 the productivity during January-March is about 502.54 tons. With respect to productivity, the export material is about 96.65% of total productivity that is almost equal to 485.54tons.

Quality assessments

According to EU standards, the quality parameters such as size, color, sugar and free from diseases and defects are important factors to import the grapes from India and

other countries. All these parameters are considered for Thompson seedless and its mutant varieties.

Increased area and productivity

Area required for grape cultivation has a major influence in productivity. During 2015-16, total area of grape production was 38.37 acre with a total productivity of 206.5 tons, whereas it has been increased up to 502.54 tons with a total area of production of 62.24 acre in 2016-2017.

Increased productivity and export

It was found from gathered data that 70% of total productivity increases in 2016-17 than the previous few years. As a result of which tonnages of grapes for export has been increased up to 68%. If grape production and export increases at this rate with sustainability in quality parameters, then only India can feed the world by 2050 with best quality table grapes.

Reasons for choice of grape cultivation and export

The reason for cultivating export quality grapes at sangli was mainly due to availability of favorable climatic condition in this region. The other reasons includes taking from family legacy and for additional source of income. Only one exceptional reason was found for a lady farmer was to be independent as a women. It has been observed that 60% cultivates and exports grapes because of its favorable climatic condition, 35% does it because of family legacy (Table 4 and Fig 4).

Waste management

Waste management of any industry is one of the important steps. For export of table grapes, there is a huge wastage to maintain quality parameters.

Table.1 Different varieties of grapes available in India

Varieties	Characteristics	
	Color	Availability of Seed
Anab-e-Shahi	White	Seeded
Bangalore Blue Syn	Black	Seeded
Isabella	Black	Seeded
Bhokri	White	Seeded
Flame Seedless	Red	Seedless
Gulabi Syn	Purple	Seeded
Muscat Hamburg	Purple	Seeded
Perlette	White	Seedless
Sharad Seedless - A mutant of Kishmish Chorni	Black	Seedless
Thomson Seedless and its mutants (Tas – A – Ganesh, Sonaka and Manik Chaman)	White	Seedless

Source: S.D. Shikhamany, Grape Production in India, 2009

Table.2 Grape Cultivation Crop Concentration Index

Sl. No.	Tahsils	2001-02	2013-14
1.	Miraj	1.65	2.06
2.	Palus	N.A.	2.12
3.	Tasgaon	3.03	2.67
4.	Khanapur	1.67	0.63

Source: Gade and Gaikwad, 2013-14

Table.3 Quality Parameters maintained for Export quality grapes at Sangli

Country	Size	Sugar	Color
European Countries	Minimum 16.5mm	Minimum 15.5°Brix	Fresh White Green
Canada	Minimum 17.5mm	Minimum 17°Brix	Fresh White Green

Table.4 Farmer's Opinion on reasons for choice of grape cultivation and Export

Reasons	Opinions (%)			
	Male Farmers	Lady Farmers	Exporters	Others
Availability of favorable Climatic Conditions	65.52	20.21	10.27	4
Taken From Father Legacy	35	0	45	20
Additional Source of Income	55	25	18	2
High yield	15	5	75	5
Demand for Export	3	1	94	2
To be independent	8	10	80	2

Fig.1 Monthly (Jan -Mar, 2017) productivity at Sangli, Maharashtra

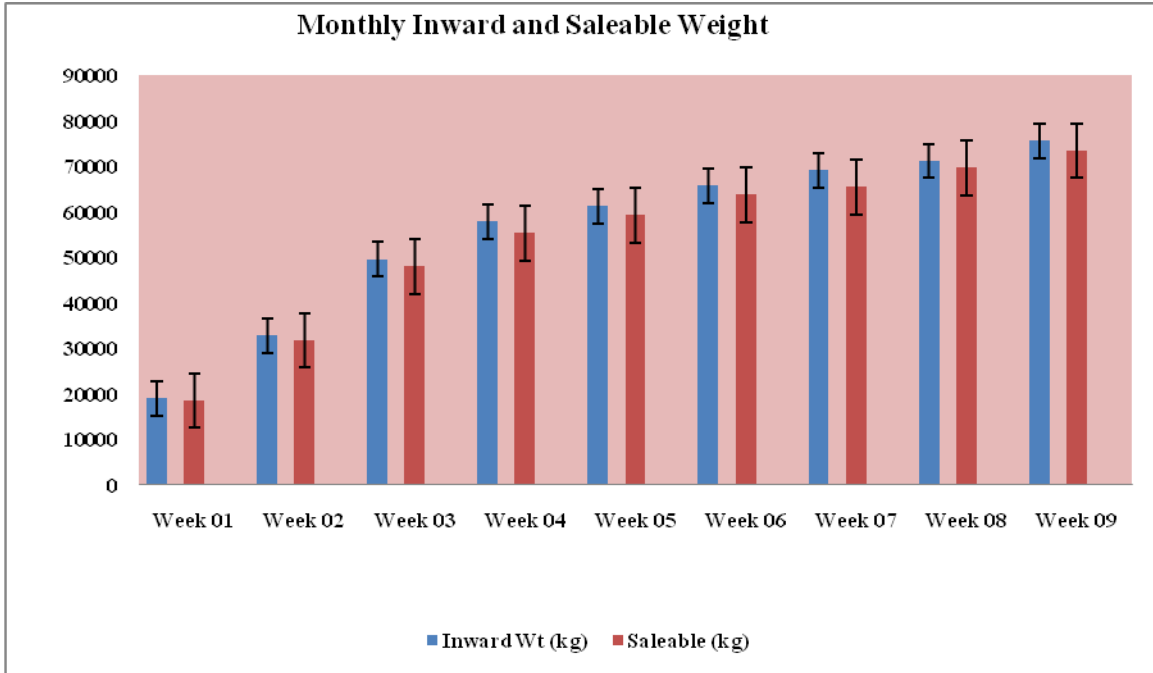


Fig.2 Increased area with increased productivity (2016-17)

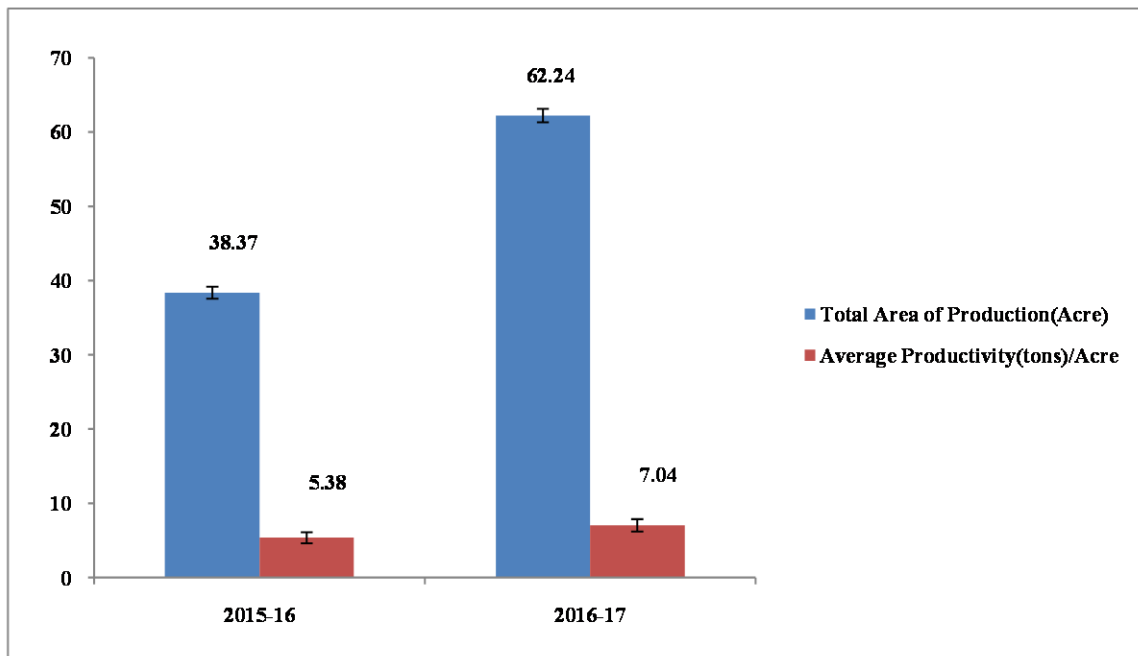


Fig.3 Increased productivity (in tons) and export in 2016-17

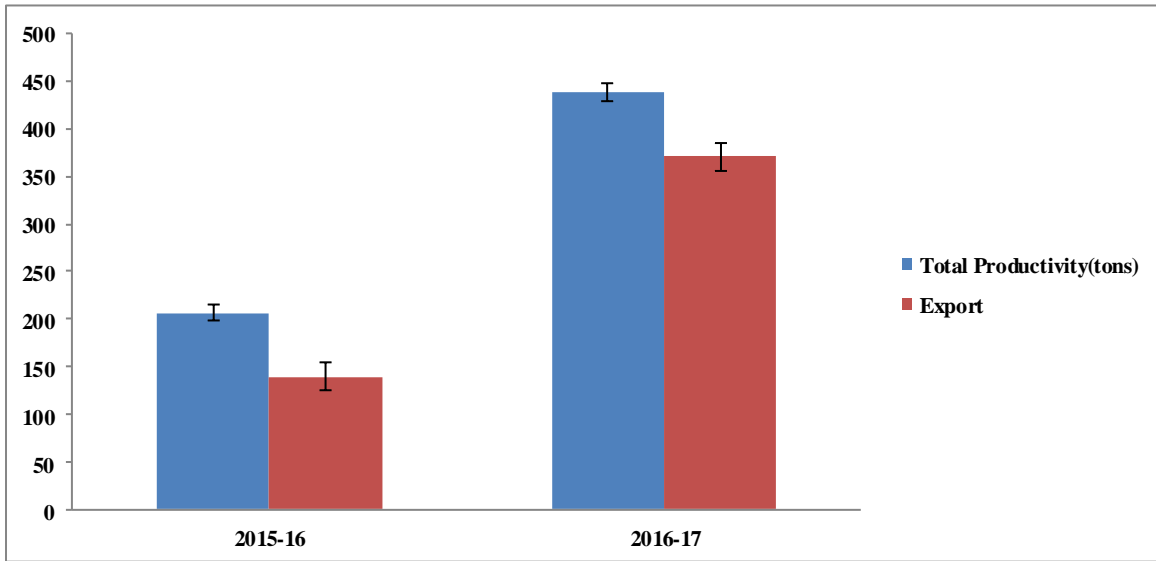


Fig.4 Farmer's opinion on reasons for choice of grape cultivation and export

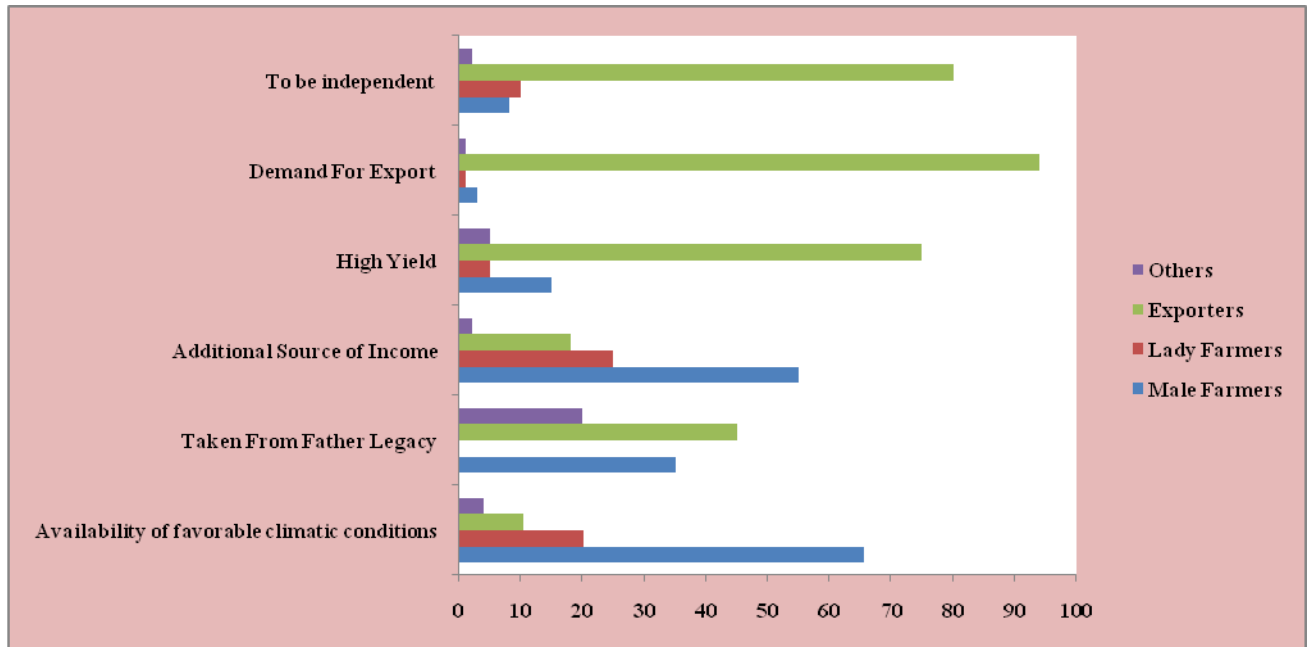
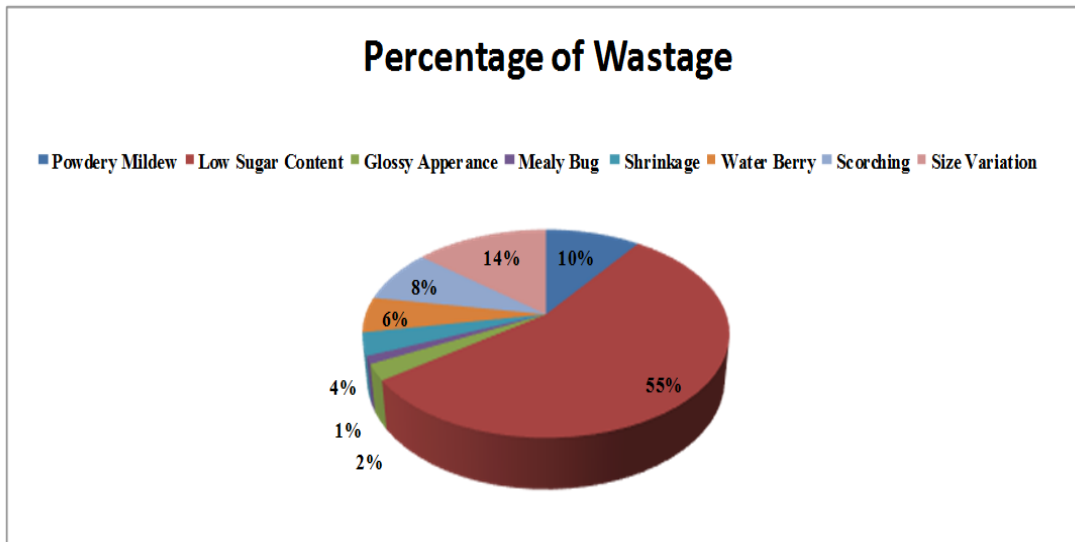


Fig.5 Percentage of wastage at Sangli in Maharashtra during Jan-Mar, 2017



All of the wastage was due to mainly glossy appearance, shrinkage, fungal rotting and defects due to diseases. All of these waste grapes can be classified as per following (Fig. 5).

In conclusion, now-a-days, total grape production in India is about 2.58 million MT and per capita availability of 2 kilograms annually.

Now, the growth rate of 4% if maintained then grapes production will be approximately 9.75 million MT by 2050. Presently, 80 percent of total grapes exported produces in Maharashtra. There is a wide scope of increasing productivity by using new technologies. By doing this, India can feed the world by 2050. To achieve these targets, a wide range of research work is needed. The complete package of practices including selection of variety and compatible rootstock, vineyard establishment including training systems, variety specific canopy architecture for different end uses such as table grapes, raisin making, or for wine making, use of growth regulators, irrigation and nutrient management, diseases and insect and mite pests management through use of

environment friendly chemicals, bio-pesticides, botanicals has to be developed and should regularly fine tune to comply with domestic and international standards, production of quality grapes with sustainable yields are possible only with these measures.

Future prospects

India achieves its position for primarily table grapes production. Evaluation of this scenario tells that new researches can develop this field of horticulture. Restoring the germ-plasm for future development is one of the important steps to feed the world by 2050. The Grape is one of the first commercially cultivated fruit crop and its cultivation has developed into science by itself. Many new developed varieties shelf –life has been extended up to 6-9 months in cold storage. During raining heavy yield losses occur due to flower drop or bunch rots in cultivated clones of Thompson Seedless and Sharad Seedless. 2A clone of Thompson Seedless do not suffer losses under such situations. Protected cultivation of grapes by plastic bags in Spain and Italy is used. Improving such new technologies, can only make this goal complete.

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