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Status of area and production of grapes (*Vitis vinifera*) in Cold Arid Ladakh

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Abstract

Grapes (*Vitis vinifera*) belongs to family Vitaceae. Horticulture is emerged as an important sector of Jammu and Kashmir it is known as back bone of State economy. Its contribution in the state gross domestic product is estimated to about 21.89% for year 2016-2017. The area under the fruit in Jammu and Kashmir has increased from 2.95 lakh hectare in 2007-2008 to 3.38 lakh hectare in 2015-2016 likewise the production has increased from 16.36 Lakh MT's in 2007-2008 to 24.94 Lakh MT's in 2015-2016. Ladakh particularly known as Cold Arid Region in Northern most of India is located between 34.5° to 34.7° North latitude, 76.20 to 76.50 East longitude and at an altitude of 2,500-2,750 meters a.m.s.l. The present status of grapes both area and production wise is 2 hectare and 5 hectare, 9 MT and 5 MT in District Leh and Kargil respectively. Grapes (*vitis vinifera*) being main fruit crop and cash crop of Ladakh region has enormous scope and potential for further improvement in future with the understanding of importance of soil health management, availability and the use of improved plant materials particularly suitable to the agro climatic conditions of the area and by inducing post harvest technologies.

Keywords: Grapes, area, production, Ladakh, Cold Arid

Introduction

Grape (*Vitis vinifera*) belongs to family Vitaceae. It is one of the most important fruit crops of temperate zone, which has also been acclimatized to subtropical and tropical agro climatic conditions prevailing in the Indian sub-continent. It is a widely grown fruit in the world which originated in Asia Minor in the region between south of Black and Caspian Sea (Winkler *et al.*, 1974) [10]. From Armenia grapes spread westwards to Europe and Eastwards to Iran and Afghanistan. Grape was introduced into India in 1300 AD by the Mughal invaders. In India, grape cultivation declined after the fall of Mughal rulers but was reintroduced in south India (Aurangabad district of Maharashtra) by Mohammed-Bin-Tughlak. Since last 50 years grape is being commercially cultivated in India. It is one of the oldest fruit being grown by man. Grape is one of the most delicious, refreshing and nourishing fruit crop. Grapes can be eaten raw or they can be used for making wine, jam, juice, jelly, raisins, vinegar, grape seed extract and grape seed oil. Grape is a fairly good source of minerals like calcium, phosphorus, iron and vitamins like B₁ and B₂.

The area under grape cultivation in India is 117.6 thousand hectares with production of 24.831 lacs MT (NHB, 2013) [9]. In Jammu and Kashmir, grapes are grown in an area of 427 hectare and produces 742 MT (Anonymous, 2015) [2]. The large grape diversity represented by landraces, improved varieties, hybrids and wild relatives has to be preserved as a potential source of valuable genetic variability for different breeding purposes. To preserve and use efficiently in the future the current genetic pool, it is necessary to evaluate the extent of this diversity by identification and distinction of grape accessions, as well as the determination of genetic relationship between local cultivars and wild relatives (Negrul, 1973) [8]. In Leh district of Jammu and Kashmir, grape has been introduced very early and the plantations were made in the areas of Leh on small scale during early century. The maximum area under this fruit is in lower belt of Leh district (Angchok *et al.*, 2009) [11]. During the early period, when Ladakh was the transit point on the Central Asian trade route, and through which where the traders, nomads and invaders from Yarkand, Baltistan, Punjab, Kashmir, China and Tibet used to pass through Ladakh (Jolden, 2012) [7]. During that period the traders may have disseminated or introduced the germplasm of grapes in Ladakh from where its cultivation had been started in lower belt of Leh district, which has a milder climate. Grapes are mainly harvested during February-June in rest of the country, however in Ladakh region it is harvested during August-September which is an off season for the rest of the country and can therefore fetch higher remuneration inspite of low productivity.

Selection and domestication of superior genotypes of a particular fruit crop from existing genetic variability is absolutely essential to increase its adoption, production and diversification of orcharding system for domestic consumption as well as for marketing, which would lead to increase in farmer's income. Thus the survey and the consequent identification of superior grapes genotypes and their adoption can therefore increase the grapes productivity and thus provide better return to the farmers. So far no documented work has been conducted on this aspect in Leh District.

Horticulture is emerged as an important sector of Jammu and Kashmir it is known as back bone of State economy. Its contribution in the state gross domestic product is estimated to about 21.89% for year 2016-2017. The area under the fruit in Jammu and Kashmir has increased from 2.95 lakh hectare in 2007-2008 to 3.38 lakh hectare in 2015-2016 likewise the production has increased from 16.36 Lakh MT's in 2007-2008 to 24.94 Lakh MT's in 2015-2016 (Economic survey Jammu and Kashmir, 2017) [6]. The area, production and productivity of fruits in Jammu and Kashmir State of last three years were tabulated in Table 1.

Table 1: Area, Production & Productivity of fruits (All fruits) J&K State

Year	Kind of fruit	Area (Lakh Hect.)	Production (Lakh MTS)	Productivity Per Hect.
2014-15	Fresh	2.44	14.55	5.96
	Dry	1.22	2.57	2.29
	Total	3.56	17.12	8.25
2015-16	Fresh	2.42	22.18	9.16
	Dry	0.96	2.76	2.87
	Total	3.38	24.94	12.03
2016-17	Fresh	2.42	19.59	8.09
	Dry	0.97	2.76	2.84
	Total	3.38	22.35	10.93

Source: (Economic Survey Jammu and Kashmir, 2017) [6]

Material and Methods

A comprehensive survey was conducted in both Districts of Ladakh (Leh and Kargil). The present study was based on the secondary data collection. The present survey was conducted under the guidance my M.Sc. and are participated by research scholars from SKUAST-K. The main source of data collection include economic survey, Directorate of horticulture Kashmir, District horticulture office Kargil, District horticulture office Leh, magazines, reports and journals. The data has been analyzed, arranged and interpreted through tabulation.

Results and Discussion

In pursuing the objectives of the survey the data on the area and annual production of grape year wise was tabulated from 2001 to 2017. The data in Table 2 revealed that the area under the grape in 2001, district Leh and Kargil was 0 hectare and 5 hectare respectively, with a production of about 0 MT and 5 MT respectively. While as the present status in 2017 with respect to area and production it was 2 ha and 5 ha, 9 MT and 5 MT in district Leh and Kargil respectively. The total area covered under both district in 2001 was 5 hectare while as in 2017 it reached about 7 hectare and in terms of production it was 13 MT in 2001 compared to 14 MT in 2017. The year-wise data of area covered and production in apricot from 2001 to 2017 were tabulated in Table 2 and 3. The area and

production under different fruit crops in district Leh were also tabulated in Table 4.

Table 2: Area under Grape from 2001 to 2017 in Ladakh Region.

Year	Area (Hect.)		
	District Leh	District Kargil	Total
2001-2002	0	5	5
2002-2003	2	5	7
2002-2003	2	5	7
2004-2005	4	7	11
2005-2006	4	7	11
2006-2007	4	7	11
2007-2008	9	4	13
2008-2009	2	4	6
2009-2010	2	4	6
2010-2011	2	4	6
2011-2012	1	4	5
2012-2013	2	4	6
2013-2014	-	-	-
2014-2015	0	4	4
2015-2016	2	5	7
2016-2017	2	5	7

Source: (Directorate of Horticulture Kashmir, 2018)

Table 3: Grape Production from 2001 to 2017 in Ladakh Region

Year	Production (MT)		
	District Leh	District Kargil	Total
2001-2002	0	5	13
2002-2003	9	5	14
2004-2005	9	5	15
2005-2006	0	5	5
2006-2007	0	5	5
2007-2008	9	4	13
2008-2009	9	4	13
2009-2010	9	4	13
2010-2011	10	4	14
2011-2012	10	4	14
2012-2013	10	4	14
2013-2014	9	4	13
2014-2015	9	4	13
2015-2016	9	5	14
2016-2017	9	5	14

Source: (Directorate of Horticulture Kashmir, 2018) [4]

Table 4: Area and Production under different fruits in District Leh (2016-2017)

Name of fruits	Area (hect.)	Production (MT)
Fresh Fruits		
Apricot	791.57	1923.41
Apple	797.67	4327.30
Pear	2.69	9.06
Peach	4.31	7.38
Plum	31	53
Grapes	2.01	9.01
Cherry	67	1.31
Dry fruits		
Almond	2.12	1.03
Walnut	4.70	109.46
Total	1703.07	6440.96

Source: (District Horticulture officer Leh)

Conclusion

It has been concluded that grape being a one of the important fruit crop and cash crop of lower belts of Ladakh region has confined to a very small portion in Ladakh in terms of area and production is almost static from more than decade but there is enormous scope and potential for further

improvement in future by creating awareness about nutritional values of the fruit, understanding of importance of soil health management, availability and the use of improved plant materials particularly suitable to the agro climatic conditions of the area and by inducing post harvest technologies. A limited marketing facility in local as well as outside the districts is one of the major drawbacks in the production and quality of grape. The value addition of grape products will bring a good return to the orchardist which ultimately improves their socio-economic conditions. Though the area and production was increasing almost negligible compared to the other parts in country which are known for the grape production, quality and value added products of grapes. Krishi vigyan Kendra and District Horticulture department can play a vital role in providing the planting material to the farmers, provide training's about cultivation technique's and to develop the interest among the orchardist for grape fruit.

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