



AN OUTLOOK OF GUAR (*Cyamposis tetragomoloba* L.) PRODUCTION IN INDIA

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Abstract- The present study examined the prospects of guar (*Cyamposis tetragomoloba* L.) crop production in India. To achieve the stipulated objectives of study, secondary data were collected. The study revealed that Rajasthan was the major guar producing state followed by Gujarat, Haryana and Punjab. The study also elucidates that area under guar crop which was 2903 thousand hectares with production of 90 thousand metric tonnes (MT) of guar during 2001-02 and area increased to 3448 thousand hectare with production of 2218 thousand MT during the year 2011-12. The production of Guar in India has seen wide variations during the recent past ranging from 659 to 2415 thousand tonnes due to the over dependence of the crop on monsoon precipitation over the period of study. The overall growth of 1.32, 9.83 and 8.21 per cent per annum was calculated for area, production and yield of guar bean in India, respectively from the year 2000-01 to 2014-15. Major quantities of guar products were exported to different countries like USA, Germany and China during the last ten years with the growth rate of 20.50, -2.75 and 15.70 per cent per annum, respectively. During the year 2012-13, export increased to 244.83 thousand MT particularly for these three countries against total export of 408.57 thousand MT with a growth rate of 14.52 per cent per annum. Lastly, it was inferred that to make guar farming more remunerative, Government initiatives such as to ensure farmers by assured prices, marketing facilities for guar crop and farmer awareness camps should be conducted.

Keywords- Guar production, Import-export, Guar gum processing

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Introduction

Guar commonly known as Cluster bean, (*Cyamposis tetragomoloba* L.) is a drought and high temperature tolerant deep rooted summer annual legume of high social and economic significance. Guar or cluster bean is believed to have originated in Africa but is been grown throughout southern Asia since ancient times as a vegetable and fodder crop. The crop was introduced to Australia from the United States in the early 20th Century and evaluated in New South Wales, Queensland and the Northern Territory [1]. Australia was targeted as a potential producer of guar grain by 'The Celanese Company' whereupon the Queensland Department of Agriculture and CSIRO was involved in conducting a number of trials using imported seed from India and the USA to determine the agronomic criteria necessary to grow the crop successfully [1,2].

Guar has been cultivated in India and Pakistan for ages for use of its tender pods as fresh vegetables and other parts of the plants to be used as cattle feed. Guar was recognised as a beneficial rotation crop and considered to have greatest potential on the drier margins of the cropping zone where summer crops such as sorghum and sunflower were not economically viable. Guar is grown mainly in arid zones i.e. Rajasthan, Gujarat, Haryana and Madhya Pradesh. Jodhpur City in the North Western state of Rajasthan in India is the

most important processing centre of Guar gum and contributes approximately 40 per cent of the world's Guar Gum supply. The [Table-1] showed the processed outcome of guar seed which depicts that churi consists the major share of guar seed by 34.50 % followed by korma, gum and waste.

Table 1- Different product realised from processing of guar seed

Processed outcome	Share (%)
Gum	29.25
Korma	32
Churi	34.5
Waste	4.25
Total	100

Materials and Methods

The present study was based on secondary data. The data on area, production and yield of guar in India from 2000-01 was collected from report of CCSNIAM, Jaipur. The data pertaining to export of guar to other countries (2003-04 to 2012-13) and district wise top most guar production in India (2001-02 to 2011-12) were compiled from the websites of APEDA and NCDEX.

Descriptive statistics i.e. growth rates and percentages were used wherever necessary to examine the changing scenario of guar bean production in India, exports of guar to different countries over the years and also to examine the changes in guar cultivation of the top most guar producing districts of the country.

Results and Discussion

Indian Scenario

India is the world leader in production (80% of world production) of guar, which is grown in the north- western parts of country encompassing states of Rajasthan (*Jodhpur, Ganganagar, Sirohi, Dausa, Bikaner, Hanumangarh and Jhunjhunu* districts), Gujarat, Haryana and Punjab. Rajasthan is the largest growing state of Guar seed in the country accounting about 70 per cent of total production and remaining is in Gujarat and Haryana. More recently world demand for guar gum has increased and continues to grow at 2 per cent per annum, current production levels are estimated at 190 000 tonnes processed gum (500,000 tonnes grain), 90 per cent of which were produced by India [3].

There is huge demand for guar derivatives and these have extensive use in a number of industries such as petroleum, textile, paper, food and pharmaceuticals etc. The production of Guar in India has seen wide variation during in recent past ranging from 659 to 2415 thousand tonnes due to the over dependence of the crop on monsoon precipitation [Table-2]. Only 199 thousand tonnes of Guar bean was produced from an area of 975 thousand hectares during 2002-03 due to severe drought. A harvest of 2715 thousand tonnes from an area of 5603 thousand hectares was achieved in 2013-14 due to good monsoon. In spite of the fluctuation in the area and production of Guar, an increasing trend has been observed during last decade in acreage under the crop and production of Guar bean in India.

Export of Guar Products from India

India mainly exports guar products to USA, Germany and China. The major guar products were exported to USA followed by Germa-

ny and China [Table-3]. The exports were increasing over the years for all the countries. During the year 2003-04, the export to USA was 44.68 thousand MT which increased to 97.15 thousand MT during the year 2008-09 and then further increased to 244.83 thousand MT for the year 2012-13 with a growth rate of 20.50 per cent per annum. Export to Germany which was 15.54 thousand MT during 2003-04 has shown a decreasing trend to 12.08 thousand MT for the year 2012-13 pertaining to a negative growth rate of -2.75 per cent per annum. Export of guar products for China which was 8.58 thousand MT during year 2003-04 has increased to 39.23 thousand MT during 2008-09 but afterwards, there was huge decline during year 2012-13 with exporting quantity of 32.27 thousand MT resulting in an overall growth rate of 15.70 per cent per annum.

Table 2- Guar bean Production in India

Year	Area (000 ha)	Production (000 tonnes)	Yield (kg/ha)
2000-01	3497	659	188
2001-02	2903	1090	375
2002-03	975	199	204
2003-04	2854	1513	530
2004-05	2867	903	315
2005-06	2956	1059	358
2006-07	3344	1169	350
2007-08	3472	1789	515
2008-09	3863	1936	501
2009-10	2996	595	199
2010-11	3382	1965	581
2011-12	3444	2218	644
2012-13	5152	2461	478
2013-14#	5603	2715	485
2014-15*	4255	2415	567
Growth rate (%)	1.32	9.83	8.21

Source: [4].

Table 3- Guar export to different countries for last ten years

Year	Total		USA		Germany		China	
	Qty. (000' MT)	Value (Rs. Crores)	Qty. (000' MT)	Value (Rs. Crores)	Qty. (000' MT)	Value (Rs. Crores)	Qty. (000' MT)	Value (Rs. Crores)
2003-04	120.56	507.88	44.68	195.57	15.54	62.49	8.58	31.91
2004-05	131.3	689.46	54.05	285.58	15.09	97.14	13.49	59.86
2005-06	186.72	1,049.24	75.19	465.77	17.78	121.47	27.13	127.23
2006-07	189.31	1,125.76	66.93	441.03	18.74	126.28	31.54	146.46
2007-08	211.17	1,125.72	81.78	484.15	17.9	97.29	34.3	158.09
2008-09	258.54	1,338.94	97.15	623.05	22.51	122.74	39.23	177.05
2009-10	218.48	1,133.29	71.92	468.45	20.6	104.15	25.26	122
2010-11	441.61	2,938.72	215.26	1,776.56	30.54	178.55	56.36	216.59
2011-12	707.33	16,523.83	434.25	12,446.03	35.1	656.23	58.03	969.94
2012-13	408.57	21,287.00	244.83	17,281.65	12.08	375.49	32.27	1,368.33
Growth rate (%)	14.52	51.74	20.5	64.26	-2.75	22.08	15.7	52.13

Source: [5]

The major issue for agro-industries is that they deal in low margin commodities where competitive market forces have typically resulted in the cost of production being very close to the value created, thus leaving relatively thin profit margins [6]. Lines imported from India and the United States had grain yields of up to 2 tonnes per hectare dry land and 4 tonnes per hectare irrigated in Central Queensland but were highly variable across seasons [7]. Supply and value chain analysis of agro-industry chains has become a valuable tool in determining where added competitive advantage can be generated for these industries [8,9].

Export (percent) share of Guar Products to Different Countries

The per cent share of quantity of guar products exported from India to USA was increasing over the years, besides for Germany and China it was decreasing over the years. In 2003-04 the quantity exported to USA was 37.06 per cent which increased to 37.58 per cent in the year 2008-09, later on it reached to 59.92 per cent during 2012-13 with an overall growth rate of 5.51 per cent per annum. The percent share of export to Germany which was 12.89 per cent during 2003-04 decreased to 8.71 per cent during 2008-09 and afterwards continuing the decreasing trend, it declined to 2.96 per cent for the year 2012-13 with a negative growth of 5.52 per cent per annum. The guar products quantity exported to China was 7.12 per cent during 2003-04 which increased to 15.17 per cent during year 2008-09 then there was huge downfall with 7.90 per cent for the year 2012-13 with an overall growth rate of 1.29 per cent per annum [Table-4].

The per cent share of value of guar products was maximum for USA with a growth rate of 8.81 per cent followed by China (0.26 per cent) and Germany with negative growth of -19.54 per cent per annum, respectively for the year 2003-04 to 2012-13. For the year 2003-04, the per cent share of value of guar products exported to USA was 38.51 per cent which increased to 46.53 per cent in 2008-09 and then during 2012-13 it further increased to 81.18 per cent. Out of the total share most of guar products were exported to USA. Similarly for China, the per cent share of value of guar product was 6.28 per cent for the year 2003-04 which increased to 13.22 per

cent for the year 2008-09 and further decreased 6.43 per cent during the year 2012-13. For the Germany, with the decrease in export of quantity of guar products the value has also decreased. The share of value of export of guar products has declined over the years and reached to only 1.76 per cent during 2012-13.

State wise Area, Production and Yield of Guar in Different States

Guar is generally produced in different states of country but is predominantly grown in Rajasthan and Haryana with maximum coverage of area. There were major fluctuations in the area under guar crop for Rajasthan, Haryana and Gujarat states of the country. In Rajasthan, area under guar production which was 2413 thousand hectares during 2001-02 decreases to only 557 thousand hectares with very less production of 28 thousand MT and a yield of 50 kg/ha during 2002-03 due to severe drought conditions [Table-5].

Table 4- Percent share of Guar exported to different countries for last ten years

Year	USA		Germany		China	
	Qty	Value	Qty	Value	Qty	Value
2003-04	37.06	38.51	12.89	12.3	7.12	6.28
2004-05	41.16	41.42	11.49	14.09	10.27	8.68
2005-06	40.27	44.39	9.52	11.58	14.53	12.13
2006-07	35.35	39.18	9.9	11.22	16.66	13.01
2007-08	38.73	43.01	8.48	8.64	16.24	14.04
2008-09	37.58	46.53	8.71	9.17	15.17	13.22
2009-10	32.92	41.34	0.43	9.19	11.56	10.77
2010-11	48.74	60.45	6.92	6.08	12.76	7.37
2011-12	61.39	75.32	4.96	3.97	8.2	5.87
2012-13	59.92	81.18	2.96	1.76	7.9	6.43
Growth rate (%)	5.51	8.81	-5.52	-19.54	1.29	0.26

Source: [10]

Table 5- State wise area, production and yield of Guar in different States

Year	Rajasthan			Haryana			Gujarat			All India		
	A	P	Y	A	P	Y	A	P	Y	A	P	Y
2001-02	2413	763	316	196	127	648	263	112	424	2903	1090	375
2002-03	557	28	50	205	91	444	213	65	306	974	203	208
2003-04	2278	1163	511	269	117	435	266	204	766	2854	1513	530
2004-05	1944	368	189	217	254	1171	214	157	733	2867	903	315
2005-06	2445	593	243	270	289	1070	214	157	575	2956	1059	358
2006-07	2808	658	234	295	334	1132	214	157	404	3352	1100	328
2007-08	2310	622	269	300	408	1200	196	130	662	3473	1789	515
2008-09	3316	1261	380	370	602	1627	1504	527	350	3863	1936	501
2009-10	2581	201	78	252	329	1305	1327	447	337	2996	595	198
2010-11	3001	1546	515	256	333	1300	1246	730	586	3382	1965	581
2011-12	3094	1847	547	215	290	1350	37	330	889	3444	2218	157
Growth rate (%)	2.56	9.39	5.68	0.92	8.64	7.64	-17.58	11.42	7.65	1.86	7.4	-8.38

Source: [10]

Note: Area (A) in 000' Ha, Production (P) in 000' MT, and Yield (Y) in Kg/Ha

If we look at the scenario of Haryana state for guar production, the area which was 196 thousand hectares with production of 127 thousand MT and yield of 648 kg/ha during year 2001-02 has increased to 215 thousand hectares with production of 290 thousand MT and yield of 1350 kg/ha during 2011-12, respectively. After 2001-02 there was great downfall for all the major guar producing states of India. During 2008-09 there was gradual increase of area for guar crop i.e. 3316, 370 and 1504 thousand hectares in Rajasthan, Haryana and Gujarat states, respectively. In Rajasthan, area under guar cultivation was 3094 thousand hectare with production of 1847 thousand MT and yield of 547 kg/ha during 2011-12 with an overall growth rates of 2.56 per cent during for area, 9.39 per cent for production and 5.68 per cent for yield, respectively. In Haryana state, an overall growth rate was carried out of 0.92 per cent, 8.64 per cent and 7.64 per cent for area, production and yield, respectively. For Gujarat state the positive growth rate can be seen for production and yield i.e. 11.42 per cent and 7.65 per cent, respectively whereas negative growth rate of -17.58 per cent was calculated for area under guar cultivation in Gujarat. If we talk about the overall situation of India there was positive growth rate of 1.86 per cent for area, 7.40 per cent for production and negative growth rate of 8.38 per cent for yield over the years.

Conclusions

The study revealed that area under guar crop which was 2903 thousand hectares with production of 90 thousand metric tonnes (MT) of guar during 2001-02 increased to 3448 thousand hectare with production of 2218 thousand MT during the year 2011-12.

Major quantities of guar products were exported to three countries i.e. USA, Germany and china pertaining to an export growth over the years of 20.50, -2.75 and 15.70 per cent per annum, respectively.

The per cent share of quantity of guar products exported from India to USA was increasing over the years, for Germany and China it was decreasing over the years.

Guar production in India has shown a positive growth rate of 1.86 per cent for area under guar crop, 7.40 per cent for production and negative growth rate of 8.38% for yield.

In Rajasthan, area under guar production which was 2413 thousand hectares during 2001-02 decreases to only 557 thousand hectares with very less production of 28 thousand MT and a yield of 50 kg/ha during 2002-03 due to severe drought conditions.

In Haryana state, the area which was 196 thousand hectares with production of 127 thousand MT and yield of 648 kg/ha during year 2001-02 has increased to 215 thousand hectares with production of 290 thousand MT and yield of 1350 kg/ha during 2011-12, respectively.

For Gujarat state, the positive growth rate can be seen for production and yield i.e. 11.42 per cent and 7.65 per cent, respectively whereas negative growth rate of 17.58 per cent was calculated for area under guar cultivation.

Suggestions

- Research emphasis on development of high yielding varieties (HYV's) and development of processed guar gum products should be given.
- Farmer-Industry linkages to be enhanced through direct market in arrangements at the mandi yards and promotion of contract

farming. Guar crop is highly dependent on monsoon rainfall and if production fails there is no risk cover for farmers. Therefore, crop insurance scheme in guar be started and farmers' guar crop should be insured.

- Many of the guar processing industries are small and does not have skilled labour, and operate under unhygienic conditions. There is urgent need of capacity building of manpower working with guar processing industries in all respect including food safety and quality aspects.
- Proper incentive schemes considered for development of value added products by devising some value addition norms by the concerned departments.
- For the long term survival of guar industry, it is very important to develop domestic demand. The association of Guar Gum Processors should take up with the Ministry of Food Processing and authorities to permit use of guar in processed food.
- There should be considerable programmes planned by the Research institutions to promote the applications of guar products as food ingredients.

Conflicts of Interest: None declared.

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