*Available online at http://www.journalcra.com*

*International Journal of Current Research*
*Vol. 7, Issue, 05, pp.15512-15516, May, 2015*

**INTERNATIONAL JOURNAL OF CURRENT RESEARCH**

**ISSN: 0975-833X**

**RESEARCH ARTICLE**

# COST OF CULTIVATION OF SUMMER BAJRA IN BANASKANTHA DISTRICT OF GUJARAT STATE

**Chaudhari, D. D., *Thakar, K. P. and Pandya, S. P.**

Agriculture Economics Department, C.P. College of Agriculture, Sardarkrushinagar Dantiwada Agricultural University, Sardarkrushinagar-385506 Banaskantha (North Gujarat)

**ARTICLE INFO**

***Article History:***
Received 17th February, 2015
Received in revised form
20th March, 2015
Accepted 30th April, 2015
Published online 25th May, 2015

***Key words:***
Deesa and Tharad of Banaskantha

**ABSTRACT**

The present study entitled "Cost of cultivation of summer bajra in Banaskantha district of Gujarat state" was undertaken to calculate the cost of production of summer bajra. The study is based on data collected from 126 farmers selected from 6 randomly selected villages and 20 market functionaries in two market areas namely Deesa and Tharad of Banaskantha district of Gujarat state.



## INTRODUCTION

Pearl millet (*Pennisetumglaucum* L.) is the most popular cereal crop grown in tropical semi-arid regions of the world. The common name of Pearl millet over a large part of India is *bajra* or *bajri.* It is the staple food for millions of people in the arid and semi-arid tropics of the world. The nutritive value of bajra grain is fairly higher with carbohydrate (69.4 per cent), fat (5 percent), marginal protein (9-11 percent) and minerals (2.7 percent). It is rich in vitamin A and B.In India, bajra ranks fourth in acreage after rice, wheat and sorghum. Bajrais extensively grown in the dry areas of western and southern India and along southern peripheries of the Sahara desert in Africa. It is also grown as fodder crop in the south-eastern USA, Australia, South Africa and other regions. Due to modernization the production has increased manifold, but farmers are not able to produce more food crops because of climatic and other problems. The efficient agricultural marketing system is one of the important means of raising the income levels of cultivators. In our country, marketing of different commodities is still not efficient. There were different intermediates linked in marketing process who take their higher margins; commission and other market fees. Due to this, price received by farmer for his produce is affected adversely. During the last few years due to modernization and commercialization of Indian agriculture, farming was dependent more and more upon purchased inputs supplies such as hybrid seeds, fertilizers, improved technology *etc.* If the efficient marketing system is developed, it will certainly induce farmers and regions to specialize in the production of the crops according to the principle of personal or regional comparative advantage, which in turn will further increase aggregate productivity of agricultural sector and its commercialization. It was observed that the average cost of cultivation and net income per hectare of summer bajra was ` 32937 and ` 15728, respectively for the year 2013-14. The total cost and gross return over Cost-A, Cost-B, Cost-$C_1$ and Cost-$C_2$ of small farmers were highest and were found decreased with the increase in the size of holding. Among the individual cost items, cost of irrigation was the highest followed by hired labour cost, cost of rental value of owned land, chemical fertilizer, miscellaneous cost, family labour, and cost of seeds etc.

***Corresponding author: Thakar, K. P.***
*Agriculture Economics Department, C.P. College of Agriculture, Sardarkrushinagar Dantiwada Agricultural University, Sardarkrushinagar-385506, Banaskantha (North Gujarat), India.*

## MATERIALS AND MATHODS

Scientific study of any problem requires a systematic investigation using appropriate method and procedures in order to arrive at reliable, unbiased and practical conclusion. Beginning with a general description of the study area, the indicators to be selected for the study, the data base and the analytical tools and techniques to be used in the present study are discussed.

- Area of study
- Sampling technique
- Data collection

- Analytical procedure
- Limitations of the study

**Area of study**

The study was Banaskantha district of Gujarat State. The Banaskantha district was selected purposively because the summer bajra crop become most popularize among the farming community in Banaskantha district as the area under cultivation of summer bajra was increasing day by day in the district. Hence, Banaskantha district was selected for the present study and the reasons for selecting the district are as under.

- Banaskantha district has more relative importance of summer bajra crop in the cropping pattern of the Gujarat state.
- It has eleven regulated markets in the district.
- It ranked first in terms of production and area under summer bajra in the Gujarat state since last decade.

**Basic features of Banaskantha district**

- Total area:10,400.16 $km^2$ (4,015.52 sq mi)
- According to the 2011 census Banaskantha district has a population of 3,116,045, roughly equal to the nation of Mongolia or the US state of Iowa. This gives it a ranking of $11^{th}$ in India (out of a total of 640). The district has a population density of 290 inhabitants per square kilometer (750 /sq mi). Its population growth rate over the decade 2001-2011 was 24.43%.Banaskantha has a sex ratio of 936 females for every 1000 males and a literacy rate of 66.39%.

**Sampling technique**

In order to evaluate the objectives of the study, anmulti-stage stratified random sampling technique was adopted.

**Selection of Talukas**

First of all, Talukas were selected on the basis of the quantity of summer bajra handled by them. The Talukas which showed the highest arrivals of summer bajra quantity in Banaskantha district, they were Deesa and Tharad Talukas. Therefore, these two Talukas were purposively selected for in-depth study.

**Selection of villages**

At the next stage, three villages from Deesa and three villages from Tharad talukas were selected randomly. Thus, totally six villages were taken under the study relative importance of summer bajra crop in the cropping pattern observed in different villages.

**Selection of sample farmers**

At the last stage, a stratified random sampling technique was used for the selection of farmers. Farmers were classified into three different categories *i.e.,* small (0 to 2.0 ha), medium (2.01 to 4.0 ha) and large categories (4.01 to above ha) on the basis of their land holding. From each category seven farmers from each selected village randomly were selected. Thus, the sample will consist of 126 farmers from six selected villages. The details of selected farmers are given in Table 1.

**Data collection**

The primary data on the aspects like details of farm family, infrastructure, land utilization, cropping pattern, resource use structure, farm production, cost and returns as well as grading, packaging and transport of summer bajra, marketing cost and problems in production and marketing management of summer bajra was collected by survey method from the sample cultivators for the year 2013-14 with the help of well designed questionnaire to be prepared for the study purpose.

**Analytical procedure**

The data collections from different sources through various schedules were subjected to statistical analysis for evaluating the objectives of the study. The data were collected regarding the cost of cultivation of summer bajra for the year 2013-14 from selected samples of farmers. The techniques used in calculating cost of cultivation was simple average, tabular analysis and simple average adopted for identifying and comparing output, price and net profit of selected farmers, according to their size of farms and for the whole district. The cost concept that was used in farm management studies such as Cost-A, Cost-B, Cost-$C_1$ and Cost-$C_2$ was followed in the analysis. The input items included for various cost concepts were as under.

**Cost-A** : Hired human labor, bullock labor, manures, chemical fertilizers, seeds, land revenue, insecticides and pesticides, miscellaneous cost and interest on working capital. Cost-A was also referred as an operational cost

**Table 1. Distribution of selected farmers in different categories from selected Talukas of Banaskantha district**

| S.No. | Selected Talukas | Selected Villages | Numbers of selected farmers from different categories of farmer | | | Total sample farmers |
|---|---|---|---|---|---|---|
| | | | Small | Medium | Large | |
| 1. | Deesa | Agthala | 7 | 7 | 7 | 21 |
| | | Amarmpura | 7 | 7 | 7 | 21 |
| | | Manki | 7 | 7 | 7 | 21 |
| 2. | Tharad | Sandhar | 7 | 7 | 7 | 21 |
| | | Del | 7 | 7 | 7 | 21 |
| | | Kesargam | 7 | 7 | 7 | 21 |
| | Total | | 42 | 42 | 42 | 126 |

**Cost-B** : Cost-A + Rental value of own land + Interest on own fixed capital.

Cost-$C_1$ : Cost-B + Value of family laborers.

Cost-$C_2$ : Cost- $C_1$ + 10 % of Cost-$C_1$

## RESULT AND DISCUSSION

The cost of cultivation studies in an area not only furnishes information on the relative profitability of the enterprises, but also serves as a guide for better choice and combinations of farm input for maximizing returns. The cost of cultivation of bajra mainly depends on the major inputs used, techniques for cultivation, yield and prices for major inputs. Profit would depend on sale price and yield obtained and cost incurred. Generally, farmers do not take into account their fixed costs such as interest on owned fixed capital, depreciation use of own implements, farm yard manure and family labour in the total cost of production and thereby, he had relevance of Cost-A only, which includes only operational cost. But in this study the Cost-A, Cost-B, Cost-$C_1$ and Cost-$C_2$ were found from the Banaskantha district of Gujarat state.

Details of cost of production as shown in the Table 2 and Figure 1 indicated that small farmers have the highest cost of production (`33840 per hectare) followed by medium farmers (`33312 per hectare) and large farmers (`31658 per hectare). The percentage share of the cost of family labour decreased and cost of hired human labour and total human labour increase with the increase in the size of holdings. This trend was due to fact that small and medium farmers mostly depends on their family labour for farm operations, while large farmers have to depends on hired labour for completing their farm operations in time. The share of the rental value of owned land, interest of fixed capital, depreciations were decrease with the increase in the size of holdings. It was further revealed that the percentage share of farm yard manure decrease with the increase in the farm size because small and medium farmers were in the position to supply more quantity of farm yard manure to their

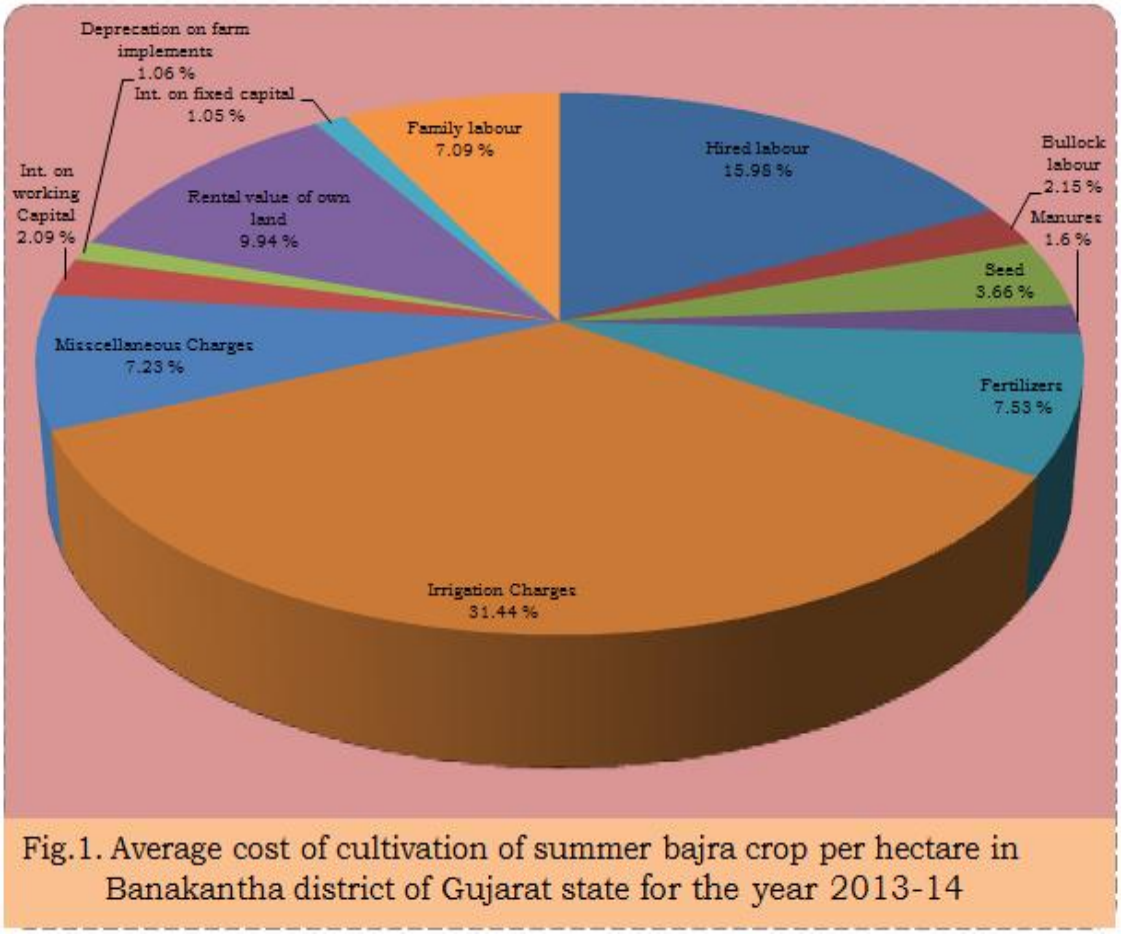


Fig.1. Average cost of cultivation of summer bajra crop per hectare in Banakantha district of Gujarat state for the year 2013-14

### Cost of cultivation of summer bajra

The per hectare cost of cultivation of summer bajra on the sample farms during 2013-14 has been estimated and the same is represented in the Table 2. It is seen from the table that, at the overall level, per hectare cost of cultivation of summer bajra (i.e. Cost '$C_2$') was worked out to ` 32937. Amongst the individual items, irrigation charges value was the highest followed by the hired labour, rental value of owned land, chemical fertilizers, miscellaneous charges, family labour, seeds etc.

fields, while the cost of chemical fertilizers decrease with the increase in the size of holdings. It was also observed that small, medium and large farmers earned ` 15185, ` 15760 and ` 16240 per hectare, respectively over Cost-$C_2$. Thus, it was clear from the table that large size of holding got more profit than small and medium size of holdings. Similar result was found by Dawit and Basavaraja (2004). The reason for this was that in the case of large farmers, the gross income was least but the cost of production was also least.

**Table 2. Details of cost of cultivation of summer bajra crop per hectare in Banaskantha district of Gujarat state during 2013-14**

| S.No. | Particular | Small Farmers | | | Medium Farmers | | | Large Farmers | | | Overall Farmers | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Physical unit | Value (`) | Percent to total cost | Physical Unit | Value (`) | percent to total cost | Physical Unit | Value (`) | percent to total cost | Physical unit | Value (`) | percent to total cost |
| 1 | Hired labour(man days) | 41.35 | 4625 | 13.66 | 44.87 | 5147 | 15.43 | 52.29 | 5965 | 18.84 | 46.17 | 5245.7 | 15.98 |
| 2 | Bullock power (pair days) | 1.86 | 753 | 2.22 | 1.35 | 685 | 2.05 | 1.38 | 692 | 2.18 | 1.53 | 710 | 2.15 |
| 3 | Seed ( Kgs) | 5.94 | 1230 | 3.63 | 5.91 | 1201 | 3.6 | 5.36 | 1184 | 3.74 | 5.74 | 1205 | 3.66 |
| 4 | Manures (Kgs) | 1.43 | 584 | 1.72 | 1.35 | 517 | 1.55 | 1.28 | 487 | 1.54 | 1.35 | 529.3 | 1.6 |
| 5 | Fertilizer N | 72.44 | | | 73.38 | | | 78.85 | | | 74.89 | | |
| | s (Kgs) P | 36.12 | 2624 | 7.75 | 34.19 | 2590 | 7.76 | 32.25 | 2246 | 7.09 | 34.19 | 2486.7 | 7.53 |
| | K | | | | | | | | | | | | |
| 6 | Irrigation Charges (`) | | 10560 | 31.2 | | 10378 | 31.1 | | 10136 | 32.01 | | 10358 | 31.44 |
| 7 | Miscellaneous charges | | 2540 | 7.5 | | 2658 | 7.9 | | 1990 | 6.3 | | 2396 | 7.23 |
| 8 | Working capital | | 22916 | 67.72 | | 23176 | 71.19 | | 22700 | 71.7 | | 22931 | 70.2 |
| 9 | Int.on working capital | | 687.48 | 2.03 | | 695.28 | 2.08 | | 681 | 2.15 | | 687.9 | 2.09 |
| 10 | Depre.on farm implements | | 389 | 1.15 | | 365 | 1.09 | | 298 | 0.94 | | 350.7 | 1.06 |
| 11 | Cost-A | | 23992 | 70.89 | | 24236 | 72.75 | | 23679 | 74.79 | | 23969 | 72.81 |
| 12 | Rental value of land | | 3389 | 10.01 | | 3258 | 9.78 | | 3181 | 10.04 | | 3276 | 9.94 |
| 13 | Int .on fixed capital | | 450 | 1.33 | | 358 | 1.07 | | 235 | 0.74 | | 347.7 | 1.05 |
| 14 | Cost-B | | 27831 | 82.2 | | 27852 | 83.61 | | 27095 | 85.58 | | 27393 | 83.8 |
| 15 | Family labour (man days) | 25.22 | 2932 | 8.66 | 22.35 | 2431 | 7.29 | 14.35 | 1685 | 5.32 | 20.64 | 2349.3 | 7.09 |
| 16 | Cost-$C_1$ | | 30764 | 90.91 | | 30283 | 90.91 | | 28780 | 90.91 | | 29942 | 90.91 |
| 17 | 10 % of Cost $C_1$ | | 3076.4 | 9.09 | | 3028.3 | 9.09 | | 2878 | 9.09 | | 2994.2 | 9.09 |
| 18 | Cost-$C_2$ | | 33840 | 100 | | 33312 | 100 | | 31658 | 100 | | 32937 | 100 |
| 19 | Output a. Main produce (Qtls.) | 26.54 | 35590 | | 27.50 | 36856 | | 27.33 | 36624 | | 27.12 | 36357 | |
| | b. By-produce (Qtls.) | 43.14 | 13435 | | 39.28 | 12216 | | 36.25 | 11274 | | 39.55 | 12308 | |
| 20 | Gross income (`) | | 49025 | | | 49072 | | | 47898 | | | 48665 | |
| 21 | Net income (`) | | 15185 | | | 15760 | | | 16240 | | | 15728 | |
| 22 | per quintal cost (`) | | 925.64 | | | 909.78 | | | 885.72 | | | 907.05 | |

**Table 3. Income from summer bajra over different cost of production in Banaskantha district, 2013-14**

| Particulars | Small farmers (` $ha^{-1}$) | Medium farmers (` $ha^{-1}$) | Large farmers (` $ha^{-1}$) | Overall farmers (` $ha^{-1}$) |
|---|---|---|---|---|
| Cost-A | 23992 | 24236 | 23679 | 23969 |
| Cost-B | 27831 | 27852 | 27095 | 27393 |
| Cost-$C_1$ | 30764 | 30283 | 28780 | 29942 |
| Cost-$C_2$ | 33840 | 33312 | 31658 | 32937 |
| Gross income | 49025 | 49072 | 47898 | 48665 |
| Net income over | | | | |
| Cost-A | 25033 | 24836 | 24219 | 24896 |
| Cost-B | 21194 | 21220 | 20803 | 21472 |
| Cost-$C_1$ | 18261 | 18789 | 19118 | 18923 |
| Cost-$C_2$ | 15185 | 15760 | 16240 | 15728 |

**Returns to summer bajra producers**

Table 3 shows different costs of cultivation with their net income over different costs. It was indicated that the Cost-A was higher for medium farmers (`24236 $ha^{-1}$) than rest of the farmer groups. Generally, farmers always count operational cost and get profit from Cost-A. It was observed that net income over Cost-$C_2$ was the highest for large farmers (`16240 $ha^{-1}$), followed by medium farmers (`15760 $ha^{-1}$) and small farmers (`15185 $ha^{-1}$). The net income over total cost *i.e.,* Cost-$C_2$ increased with increase in the size of farms. Similar results were found by Badal P. S. and Singh R.P. (2001). In general, to get higher net returns, a fixed cost per unit of land and unit of output is required to be reduced by increasing yield. There is high potentiality to increase production and productivity of summer bajra in all categories of farmers in Banaskantha district.

**Conclusion**

**Economics of summer bajra production**

The average cost of bajra cultivation was ` 32937 per hectare for the district and cost of production, returns over Cost-A, Cost-B, Cost-$C_1$ and Cost- $C_2$was decreased with increase in the size of holdings.

The cost of irrigation was the highest followed by the hired labour, the cost of rental value of owned land, miscellaneous cost, family labour, chemical fertilizer, seed etc., among the individual cost of items. The family labour cost decreased and cost of hired labour increased with increase in size of holding because small farmers used more of family labour for their farm operations, whereas large farmers had to depend on hired labour for completing their farm operation in time. The human labour cost was the highest for all the farmers and decreased with increase in size of holdings, the reason for this that the small farmers had used resources intensively in crop production. The cost of bajra production for the year 2013-14 showed that the average income over total cost was ` 15728 per hectare. The net income of large farmer was the highest being ` 16240 per hectare. The per hectare income over Cost-A of the small farmer was the highest being ` 25033.

## REFERENCES

Badal, P.S. and Singh, R.P. 2001. Technological change in Maize production: A case study of Bihar. *Indian Journal of Agricultural Economics.*56 (1): 211-219.

Dawit, L, and Basavaraja, H. 2004. Production and marketing of wheat in Dharwad district. *Indian Journal of Agricultural Marketing.*18: 74-79

*******