Journal of Pharmacognosy and Phytochemistry

Available online at www.phytojournal.com

**E-ISSN:** 2278-4136
**P-ISSN:** 2349-8234
www.phytojournal.com
JPP 2020; Sp 9(4): 490-492
Received: 20-05-2020
Accepted: 22-06-2020

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# Increasing income and employment through vegetable crops in district Kanpur Nagar of Uttar Pradesh

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**Abstract**
The investigation was carried out during 2017-18 in block Sarsaul and Bilhaur of district Kanpur with random sample of the vegetable growers. The economics and employment of three major vegetable viz., Brinjal, cauliflower and tomato were worked out at different size group of farms. The average cost of cultivation for Brinjal came to Rs. 74258.97/ha which fetched a net income of Rs. 63449.19 per hectare. The vegetable pea crop gave net income of Rs. 82235.10 by incurring input cost of Rs.73276.49 per hectare. The cauliflower crop reflects a net return of Rs. 68117.21/ha on investment of Rs.57141.09 as input cost while tomato crop produced a net benefit of Rs. 84142.71/ha by incurring a input cost of Rs. 86679.59/ha. A comparative study revealed that tomato crop reflects highest gross return of Rs. 170822.30/ha and the front of net return tomato also proved best. The cost of production per quintal of Brinjal, Vegetable pea, tomato and cauliflower came to Rs. 588.61, Rs. 588.61, Rs. 421.73 and Rs. 330.73 respectively. The input- output analysis revealed that cauliflower crop proved to economical and remunerative fetched more than two times return over cost (1:2.19 B:CR) while vegetable pea ranked second with 1:2.12 times benefit over investment. On employment front tomato generated highest employment days (154) followed by Brinjal 137-man days, vegetable pea 131 days and cauliflower 123-man days in the study area.

**Keywords:** Vegetable, income, crop, employment, input cost.

## Introduction
India is world's largest producer of vegetable next only to China. Vegetables are excellent source of vitamins, particularly niacin, riboflavin, thiamin and vitamins A and C. They also supply minerals such as calcium and iron besides protein and carbohydrates. The credit for this vertical expansion in vegetable production and protection technologies due to new technologies (Kumar and Arora, 1999) [3].

Per capita consumption of vegetables in our country is 388 g/day as against 400 g recommended dietary allowance (RDA). During 2017-18 the area under vegetables was 10.26 Million Hectares with a production of 184.40 Million Tones in India. (For this period the total vegetable production was highest in case of Uttar Pradesh (283.16 Million Tones) (Anonymous, 2018) [2]. Uttar Pradesh have occupied about 1200060-hectare area under vegetable crops while district Kanpur have 14673 hectares area under different vegetable crops during investigation period (Anonymous, 2016) [1]. However, vegetables occupy hardly 2-3 per cent of total cropped area of the country which is very low in view of national demand. Hence, it is necessary to increase the production productivity and economic return per unit of vegetable to fulfill the desired need of growing population and to ensure better nutrition by adopting improved technology.

## Materials and methods
The investigation was carried out in district Kanpur during 2017- 18. A multi stage random sampling technique was adopted to select block, village and vegetable growers. Out of ten development blocks of district Kanpur nagar, two blocks namely Sarsaul and Bilhaur was selected purposely where majority of farmers were engaged in vegetable farming. A list of all the villages growing vegetables in the block Sarsaul and Bilhaur was prepared. Out of these, ten villages viz., Raipur, Birahipur, Narval, Shishoopur, Baragaon, Rojpur, Bilhaur Dehat, Kamsan, Subhanpur and Shivdattpur were selected randomly for the investigation. A total of hundred vegetable growers (54- marginal, 29- small and 17- medium) were selected randomly from the universe of five selected villages on the proportion of farmers falling in each village under different size group of farms. These farmers were grouped according to the size of land holding they possess, that marginal (0-1 ha), small (1-2 ha) and medium (2-3 ha). Three major

vegetables, Brinjal, cauliflower and tomato were taken for study and analysis on the basis of more area and production at different size group of farms. The enquiry was conducted by survey method. The data were collected by personal interview with selected vegetable growers on well prepared schedules. The tabular analysis, weighted average, costs and return analysis have been worked out for analyzing the different data.

**Results and discussion**

The results obtained from the present investigation have been discussed in the following sub heads:

**Yield and return from brinjal production**

The Table 1, reveals that Brinjal crop gave an average net income of Rs. 63449.19 by incurring an input cost of Rs. 74258.97 on per hectare basis. The average family income and farm business income were worked out at Rs. 77776.95 and Rs. 84776.95 per hectare, respectively. The input -output ratio for Brinjal crop came to 1:1.85 while cost of production was worked out to Rs. 588.61 per quintal. A size group wise analysis shows that net returns, family labour income and farm business income were higher on medium farms as compared to marginal and small farms. It was due to higher yields and income in relation to input on medium farms.

**Table 1:** Yield and returns from brinjal crop (in Rs./ha)

| Particular | Size groups in hectare | | | Average |
|---|---|---|---|---|
| | Marginal | Small | Medium | |
| Input cost | 66817.03 | 75713.22 | 80246.67 | 74258.97 |
| Yield in q/ha | 109.34 | 128.74 | 141.62 | 126.57 |
| Rate (in Rs./q) | 1088.00 | 1088.00 | 1088.00 | 1088.00 |
| Gross income | 118961.92 | 140069.12 | 154082.56 | 137708.16 |
| Net income | 52144.89 | 64355.90 | 73835.89 | 63449.19 |
| Family labour income | 70239.53 | 79928.16 | 83152.28 | 77776.95 |
| Farm business income | 77239.53 | 86928.16 | 90152.28 | 84776.95 |
| Cost of production/q | 611.09 | 588.11 | 566.63 | 588.61 |
| Input output ratio | 1:1.78 | 1:1.85 | 1:1.92 | 1:1.85 |

**Yield and returns from vegetable pea production:** The Table 2 shows that on an average vegetable pea crop gave a gross income of Rs. 155511.59 and a net income of Rs. 82235.10 by incurring input cost of Rs.73276.49 per hectare basis. The average family labour income and farm business income were worked out Rs. 95794.99 and Rs.102794.99 per hectare, respectively. The cost of production per quintal came to Rs. 1047.70 while input- output ratio reflect that vegetable pea crop can fetch more than two times return on investment of Re. l. A size group wise examination shows that yield levels, gross and net incomes were comparatively higher on medium farms due to better utilization of available resources.

**Table 2:** Yield and returns from Vegetable pea crop (in Rs. /ha)

| Particular | Size groups in hectare | | | Average |
|---|---|---|---|---|
| | Marginal | Small | Medium | |
| Input cost | 66291.16 | 73536.82 | 80001.48 | 73276.49 |
| Yield in q/ha | 62.00 | 70.11 | 77.72 | 69.94 |
| Rate (in Rs./q) | 2223.50 | 2223.50 | 2223.50 | 223.50 |
| Gross income | 137857.00 | 155889.58 | 172810.42 | 155511.59 |
| Net income | 71565.84 | 82352.76 | 92808.94 | 82235.10 |
| Family labour income | 89398.61 | 97025.04 | 100983.56 | 95794.99 |
| Farm business income | 96398.61 | 104025.04 | 107983.56 | 102794.99 |
| Cost of production/q | 1069.21 | 1048.88 | 1029.36 | 1047.70 |
| Input output ratio | 1:2.08 | 1:2.12 | 1:2.16 | 1:2.12 |

**Yield and returns from tomato production:** Table -3 reveals that on an average tomato crop gave Rs. 170822.30 gross income and Rs. 84142.71 net income per hectare by incurring a cost of Rs. 86679.59 per hectare basis. The average family labour income and farm business income were worked out to Rs. 101083.99 and Rs. 108083.99 per hectare, respectively. The input - output analysis of tomato crop fetched 1.97 times return on investment. Similar results were confirmed by (Senthil Kumar, 2007) [5]

As regard the cost of production per quintal it was calculated out as Rs. 421.73. A size group wise investigation shows that all types of returns were higher on medium farms as compared to marginal and small farms. It was due to higher yield because of more investment of inputs on medium farms.

**Table 3:** Yield and returns from Tomato (in Rs. /ha)

| Particular | Size groups in hectare | | | Average |
|---|---|---|---|---|
| | Marginal | Small | Medium | |
| Input cost | 78243.96 | 84927.81 | 96866.99 | 86679.59 |
| Yield in q/ha | 182.35 | 201.67 | 233.42 | 205.81 |
| Rate (in Rs./q) | 830.00 | 830.00 | 830.00 | 830.00 |
| Gross income | 151350.50 | 167386.10 | 193738.60 | 170822.30 |
| Net income | 73106.54 | 82458.29 | 96871.61 | 84142.71 |
| Family labour income | 93350.29 | 100403.61 | 109506.37 | 101083.99 |
| Farm business income | 100350.29 | 107403.61 | 116506.37 | 108083.99 |
| Cost of production/q | 429.09 | 421.12 | 414.99 | 421.73 |
| Input output ratio | 1:1.93 | 1:1.97 | 1:2.00 | 1:1.97 |

**Yield and returns from cauliflower production:** The Table 4 shows that on an average cauliflower crop gave a gross income of Rs. 125258.25 and a net income of Rs. 68117.21 by incurring input cost of Rs. 57141.04 per hectare basis. The average family labour income and farm business income were worked out Rs. 81300.40 and Rs.88300.40 per hectare, respectively. The cost of production per quintal came to Rs.330.73 while input- output ratio reflect that cauliflower crop can fetch more than two times return on investment of Re. l. A size group wise examination shows that yield levels, gross and net incomes were comparatively higher on medium farms due to better resources management.

**Table 4:** Yield and returns received from cauliflower (in Rs. /ha)

| Particular | Size groups in hectare | | | Average |
|---|---|---|---|---|
| | Marginal | Small | Medium | |
| Input cost | 52966.07 | 58373.44 | 60083.59 | 57141.04 |
| Yield in q/ha | 161.22 | 176.40 | 180.68 | 172.77 |
| Rate (in Rs. /q) | 725.00 | 725.00 | 725.00 | 725.00 |
| Gross income | 116884.50 | 127890.00 | 130993.00 | 125258.25 |
| Net income | 63918.43 | 69516.56 | 70909.41 | 68117.21 |
| Family labour income | 80779.25 | 83728.98 | 79385.73 | 81300.40 |
| Farm business income | 87779.25 | 90728.98 | 86385.73 | 88300.40 |
| Cost of production/q | 328.53 | 330.91 | 332.54 | 330.73 |
| Input output ratio | 1:2.21 | 1:2.19 | 1:2.18 | 1:2.19 |

**Economics and level of employment from major vegetable crops:** It is evident from the Table 3 that tomato crop incurred highest cost of cultivation Rs. 86679.59 per hectare with a tune of Rs. 170822.30 gross return per hectare while highest net return of Rs. 84142.71 per hectare was also obtained through tomato crop. Highest intake of family labour was observed in tomato crop with highest farm business income of Rs. 108083.99 per hectare. The highest cost of production 1048.88 per quintal was worked out from vegetable pea crop while lowest cost of production Rs. 330.73 per quintal was computed for cauliflower. Cauliflower crop fetched highest

return of Rs.2.19 on investment of Re 1, while brinjal crop reflects 1.85 times return from Re. l. Maximum level of employment (154 days) was recorded from tomato crop followed by Brinjal (137 days), 131 days from vegetable pea crop and 123 days from cauliflower crop (Kumar *et al*., 2006) [4]. Overall analysis of the data and observation of investigation revealed that vegetable farming is a profitable venture in irrigated eco- system if grown in early condition because of effective demand and better remunerative prices in the market.

**Table 4:** Economics and level of employment of major vegetable crops per hectare

| Particular | Average (marginal, small, medium) size group | | | |
|---|---|---|---|---|
| | **Brinjal** | **Vegetable pea** | **Tomato** | **cauliflower** |
| Cost of cultivation Rs. /ha | 74258.97 | 73276.49 | 86679.59 | 57141.09 |
| Gross return Rs. / ha | 137708.16 | 155511.59 | 170822.30 | 125258.25 |
| Net return Rs. / ha | 63449.19 | 82235.10 | 84142.71 | 68117.21 |
| Family labour income Rs. /ha | 77776.95 | 95794.99 | 101083.99 | 81300.40 |
| Farm business income Rs. /ha | 84776.95 | 102794.99 | 108083.99 | 88300.40 |
| Cost of production/q | 588.61 | 1048.88 | 421.73 | 330.73 |
| Input output ratio | 1:1.85 | 1:2.12 | 1:1.97 | 1:2.19 |
| Level of employment (days) | 137 | 131 | 154 | 123 |

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