

Economic Analysis of Organic Chickpea Production at Organic Farming Research and Training Center (Ofrtc), MPKV, Rahuri.

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Abstract

In India, organic farmers use an array of cultural and biological practices to build soil health, manage weeds and pests and increase biodiversity. As per the available statistics, India's rank 8th in terms of World's Organic Agricultural land and 1st in terms of total number of producers. (Source: FIBL & IFOAM Year Book, 2020). Total area under organic certification process registered under National Programme for Organic Production (NPOP) is 43.39 Million ha (2020-21).

The Organic Farming Research and Training Center, MPKV, Rahuri was started cultivation and research unit producing organic crops continuously for two years i.e. 2019-20 and 2020-21 on operation holding of 16 ha.

The analysis is carried out by simple tabular method. The maximum per hectare cost involved was in the use of Heliokill followed by neem oil. The per hectare cost of cultivation i.e. cost 'C' worked out to Rs.85182.67 and Rs.92958.31 for the year 2019-20 and 2020-21 for organic cultivation chickpea respectively and benefit cost ratio was 1.13 for the year 2019-20 and 1.18 for the year 2020-21. Constraints in production and marketing of organic chickpea are major problems faced by the OFRTC, MPKV, Rahuri was lack of funds and also markets are not well established. The concluded part is, per hectare cost involved for organic inputs was maximum in the use of neem oil followed by helio kill and magic (SLNPV). The machine power, seed, manure, hired human labour and plant protection were major items contributing more than 60 percent of the total cost for the production of organic chickpea.

Introduction

Organic Farming starts with the Soil: organic agricultural practices to maintain replenish and balance soil fertility to produce healthy and better quality crops. Organic farmers use an array of cultural and biological practices to build soil health, manage weeds and pests and increase biodiversity. As per FAO, "Organic agriculture is a holistic production management system which promotes and enhances agro-ecosystem

health, including biodiversity, biological cycles, and soil biological activity. It emphasises the use of management practices in preference to the use of off-farm inputs, taking into account that regional conditions require locally adapted systems. This is accomplished by using, where possible, agronomic, biological and mechanical methods, as opposed to using synthetic materials, to fulfil any specific function within the system."

India is bestowed with lot of potential to produce all varieties of organic products due to its various agro climatic conditions. In several parts of the country, the inherited tradition of organic farming is an added advantage. This holds promise for the organic producers to tap the market which is growing steadily in the domestic and export sector. As per the available statistics, India's rank 8th in terms of World's Organic Agricultural land and 1st in terms of total number of producers.(Source: FIBL & IFOAM Year Book, 2020).

Total area under organic certification process registered under National Programme for Organic Production (NPOP) is **43.39 Million ha** (2020-21). This includes 26.57 Million ha cultivable area and another 16.82 Million ha for wild harvest collection. Among all the states, **Madhya Pradesh** has covered largest area under organic certification followed by Rajasthan, Maharashtra, Chhattisgarh, Himachal Pradesh, Jammu & Kashmir and Karnataka. During 2016, Sikkim has achieved a remarkable distinction of converting its entire cultivable land (more than 75000 ha) under organic certification. (Source: www.apeda.gov.in).

With the increase in population our compulsion would be not only to stabilize agricultural production but to increase it further in sustainable manner. The scientists have realized that the 'Green Revolution' with high input use has reached a plateau and is now sustained with diminishing return of falling dividends. Thus, a natural balance needs to be maintained at all cost for existence of life and property. The obvious choice for that would be more relevant in the present era, when these agrochemicals which are produced from fossil fuel and are not renewable and are diminishing in availability. It may also cost heavily on our foreign exchange in future.

Components of organic farming

- i) Manures
- ii) Green leaf manuring
- iii) Crop rotation
- iv) Biological management
- v) Animal husbandary
- vi) Biofertilizers
- vii) Vermicompost

The Organic Farming Research and Training Center, MPKV, Rahuri was started 2018 but actual cultivation of organic crops was started in the year 2019-20 on operation holding of 16 ha and duly certified from Karnatka State Organic Certification Agency (KSOCA), Bengaluru (Karnatka). The OFRTC farm is divided into 11 plots. The OFRTC, MPKV, rahuri has a diversified cropping pattern which includes *kharif*, *rabi*, summer crops and fruit crops namely., custard apple, guava and mango. Soybean-chickpea, soybean-wheat and

soybean-onion are major cropping sequences. The OFRTC, MPKV, Rahuri has collection of about 208 germplasm.

Keeping in view, the present study was undertaken to analyze the cost and return structure of organic chickpea production with the following specific objectives.

- 1) To examine the nature and use of organic inputs for organic chickpea production.
- 2) To estimate the resource use levels, costs and returns structure of for organic chickpea production.
- 3) To examine resource use pattern of for organic chickpea production.
- 4) To study the constraints in production and marketing of organic chickpea production.

Methodology

Sampling

1.1 Study area:- The Organic Farming Research and Training Center is selected for the study which was established in the year 2018-19 at MPKV, Rahuri.

1.2 Selection of sample:- The organic research and training center was started actual work from the year 2019-20 onwards. The research unit producing organic crops continuously for two years i.e. 2019-20 and 2020-21 is selected for the study.

1.3 Collection of data:- The special designed questionnaire is prepared and survey method is used for collecting the data on cost of cultivation, farm assets, marketing etc. from the official records of research unit.

Data analysis:- The analysis is carried out by simple tabular method. The averages, percentages and standard cost concepts is used for estimating the cost 'A', cost 'B' and cost 'C'.

Soil status

It is necessary to check the soil status before cultivating the crops under organic farming. The soil status is required for getting the certificate of organic farming. The soil status of the organically cultivated chickpea plot at OFRTC, MPKV, Rahuri is as below:

2018-19					
pH	=	7.54	K	=	683.20 (kg ha ⁻¹)
EC	=	0.14 (dSm ⁻¹)	Fe	=	0.98 (mg kg ⁻¹)
OC	=	1.05 (%)	Mn	=	12.21 (mg kg ⁻¹)
N	=	161.70 (kg ha ⁻¹)	Zn	=	0.98 (mg kg ⁻¹)
P	=	18.45 (kg ha ⁻¹)	Cu	=	4.32 (mg kg ⁻¹)

Organic Certification

The organic certificate is essential for marketing of the agricultural produce as an organic produce. The organic certificate agencies provide the certificate for 3 consecutive years (free from Agro-chemicals). The OFRTC, MPKV, Rahuri obtained certificate from Karnataka State Organic Certification Agency (KSOCA), Bengaluru (Karnataka).

Result and discussion

Nature and extent of use of organic inputs

The nature and extent of use and its cost involved in organic cultivation of chickpea are presented in table 1. It was observed from the table that, the following organic inputs were used for cultivation of organic chickpea by OFRTC, MPKV, Rahuri.

Biofertilizers	Biopesticides
<i>Rhizobium</i>	Neem oil
<i>Trichoderma</i>	Heliokill

However, the maximum per hectare cost involved was in the use of Heliokill followed by neem oil, *Trichoderma* and *Rhizobium* for 2019-20. Same trend was observed for the year 2020-21 except use of neem oil (Rs. 3160) followed by Heliokill (Rs. 1600) for organic cultivation of chickpea.

Table 1: Nature and extent of organic input use in organic chickpea production

(Per ha)

Sr. No.	Particulars	Organic chickpea			
		2019-20		2020-21	
		Quantity	Cost (Rs.)	Quantity	Cost (Rs.)
A.	Biofertilizers				
1.	<i>Rhizobium</i>	2 kg	160	2 kg	160
2.	<i>Trichoderma</i>	1 kg	200	1 kg	200
B.	Biopesticides				
1.	Neem oil	1 lit	1540	2 lit	3160
2.	Heliokill 2 % AS	1 lit	1600	1 lit	1600

Cost of cultivation

The detailed cost of cultivation organic chickpea for the year 2019-20 and 2020-21 was depicted in the table 2.

Table 2: Per hectare cost of cultivation of organic chickpea

(Rs./ha)

Sr. No.	Cost items	2019-20		2020-21	
		Cost	percent	Cost	percent
1	Hired human labour				
	a. Male	3312.64	3.89	3570.00	3.84
	b. Female	7246.40	8.51	8190.00	8.81
2	Bullock power	0.00	0.00	0.00	0.00
3	Machine power	14292.00	16.78	15244.00	16.40
4	Seed	8124.00	9.54	8124.00	8.74
5	Manures	20000.00	23.48	20000.00	21.52
6	Fertilizer				
	a. Nitrogen (N)	0.00	0.00	0.00	0.00
	b. Phosphorous (P)	0.00	0.00	0.00	0.00
	c. Potash (K)	0.00	0.00	0.00	0.00
7	Irrigation charges	1412.50	1.66	2127.73	2.29

8	Bio-fertilizers / Micronutrients	360.00	0.42	360.00	0.39
	1. Rhizobium				
	2. Trichoderma				
9	Plant protection charges	3140.00	3.69	4760.00	5.12
	1. Neem oil				
	2. Helio kill				
10	Incidental charges	1168.05	1.37	1421.51	1.53
11	Repairs on farm implements	850.20	1.00	1830.60	1.97
12	Insurance premium	0.00	0.00	0.00	0.00
13	Rab material	0.00	0.00	0.00	0.00
14	Weedicide	0.00	0.00	0.00	0.00
15	Working capital (1 to 14)	59905.79	70.33	65627.84	70.60
16	Interest on working capital @ 6 %	3594.35	4.22	3937.67	4.24
17	Depreciation on farm implements	2825.84	3.32	2416.40	2.60
18	Land revenue & other taxes	27.24	0.03	30.65	0.03
19	Cost-'A' Rs. (15 to 18)	66353.22	77.90	72012.56	77.47
20	Rental value of land	16050.00	18.84	18700.00	20.12
21	Interest on fixed capital @ 10 %	2779.45	3.26	2245.75	2.42
22	Cost – 'B' (19 + 20 + 21 + 22)	85182.67	100.00	92958.31	100.00
23	Family labour				
	a. Male	0.00	0.00	0.00	0.00
	b. Female	0.00	0.00	0.00	0.00
24	Cost – 'C' (23 + 24)	85182.67	100.00	92958.31	100.00
25	Output (Rs.)				
	Main produce	93500.00		106925.00	
	By produce	2800.00		3000.00	
	Gross returns	96300.00		109925.00	
26	Per quintal cost	3744.67		3828.01	

It is revealed from the table 2, that the per hectare cost of cultivation i.e. cost 'C' worked out to Rs.85182.67 and Rs.92958.31 for the year 2019-20 and 2020-21 for organic cultivation chickpea. Among the different paid out cost, manure, machine power, seed, female labour, plant protection charges were the major cost items. These items contributing more 50 percent to the total cost.

Cost, returns and profitability of organic chickpea production

The per ha cost, returns and profitability of Organic chickpea is presented in table 3.

Table 3: Costs and profitability of organic chickpea production

Sr.No.	Particulars	2019-20	2020-21
1.	Total cost(Rs./ha)	85182.67	92958.31
2.	Main produce (qtl/ha)	22.00	23.50
3.	Rate of main produce (Rs./qtl.)	4250.00	4550.00
4.	Gross return	96300.00	109925.00
5.	Net profit	11117.00	16967.00
6.	B:C ratio	1.13	1.18
7.	Per quintal cost (Rs./qtls)	3744.67	3832.01

It is observed from the table that, per quintal cost for production of organic chickpea were Rs.3744.67 and Rs. 3832.01 respectively for the year 2019-20 and 2020-21. The net profit received was Rs. 11117.00 for the year 2019-20 which is less than the 2020-21 (Rs.16967.00). The benefit cost ratio for organic chickpea production was 1.13 for the year 2019-20 and 1.18 for the year 2020-21.

Constraints in production and marketing of organic chickpea

I. Technical

1. Complexity in the use of different inputs of organic farming.
2. Difficulty in obtaining the recommended levels of nutrients through organics.
3. Lack of references to utilize organic waste properly as source of organic nutrients.

II. Economical

1. High cost of vermicompost and biopesticides for crop production.

III. Administrative

1. Complicated and expensive procedure of issuing certificate for organically produced crops.
2. Lengthy process of inspection of organically produced crops.
3. Construction of office building, cattle shed, poultry shed and sale counter is in progress.

IV. General

1. Dependent for cattle dung on dairy department as cattle shed construction is in progress.

V. Marketing.

1. Markets for organic produce are not well established.
2. There is no MSP Mechanism for organic produced Agril. Produce/ products.
3. Supply of organic produce is less as compared to the demand.
3. Sale counter construction is in progress.

Conclusions

1. The per hectare cost involved for organic inputs was maximum in the use of neem oil followed by helio kill and magic (SLNPV).
2. The machine power, seed, manure, hired human labour and plant protection were major items contributing more than 60 percent of the total cost for the production of organic chickpea.
3. The benefit and cost ratio for organically produced chickpea for the year 2019-20 and 2020-21 was 1.13 and 1.18.
4. The major problems faced by the OFRTC, MPKV, Rahuri was lack of funds from government.

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