SWITCH ON FOUNDATION

A Comparative Economic Analysis *of* Organic & Inorganic Cultivation *of* BLACK CUMIN in Nadia District, West Bengal

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Executive summary

In the present study efforts have been made to examine the comparative economic analysis of organic and inorganic cultivation of Black Cumin in Nadia district of West Bengal. The economics of selected organic and inorganic farmers is worked out using standard cost concepts. Primary data was collected for the Rabi season of 2022. Multistage sampling design was adopted for selection of district, tehsil, villages and cultivators. Result showed that among all the inputs, the highest and significant difference is found while applying inputs like organic manure 5.62 percent of total cost for organic and chemical fertilizers 10.83 percent of total cost for inorganic black cumin cultivation. Since the organic manure consumption in black cumin results in an increase in agriculture production, all the black cumin growers in the study region may use organic manure which may lead to reduction in the cost of production.

The use of family human labour (46.07 percent and 40.33 percent) was more than hired human labour (7.25 percent and 6.91 percent) in organic and inorganic black cumin production respectively. Yield and net returns per acre were reported higher in organic cultivation than the inorganic black cumin cultivation in the study area. The total cost incurred in organic black cumin cultivation was Rs. 45316.66, leading to a net income of Rs. 14523.14 per acre. Which is found to be 98.25 percent more net return than inorganic black cumin cultivation. Usually these organic black cumin growers sell their output directly to ONganic Foods so they get a better price for their output as compared to market prices.

1 Introduction

Black cumin (Nigella sativa L.) is an annual seed spice herb which belongs to the family of Ranunculaceae. It is also known as black seeds and in Bengali it is known as Kalojira. The species was first named by Swedish botanist Carl Linnaeus in 1753. Nigella seeds are used for edible and medicinal purposes in many countries. Nigella is widely cultivated throughout South Europe, Syria, Egypt, Saudi Arabia, Iran, Pakistan, India and Turkey. In India it is cultivated commercially in West Bengal, Punjab, Jharkhand, Himachal Pradesh, Bihar and Assam. Small scale cultivation is also taken at Uttar Pradesh, Rajasthan, Madhya Pradesh and Tamil Nadu states. It has been used as herbal medicine for more than 2000 years. Also used as a food additive and flavoring agent in many countries. The oil of Nigella sativa is so beneficial due to its content of over a hundred active components.

Two thousand years ago the Nigella sativa has been traditionally used by various cultures as a natural remedy to treat numerous diseases. Nigella oil bottle was discovered in King Tutankhamen's tomb, items entombed with a king were carefully selected to assist him in the afterlife. Black cumin seed has profound medicinal uses (Ali and Blunden, 2003). Black cumin seeds are of high economic value and contain fixed oil, essential oil, protein and carbohydrates. Seed of black cumin also contains alkaloids such as nigellidin, nigellisin and nigellimin (Baydar, 2013). Black cumin cultivation progress is expanding step by step in West Bengal because of its various worth. Since last decade NGOs like SwithON Foundation have been promoting organic farming in the study area by conducting training, demo plots and increasing awareness about organic black cumin cultivation. Due to the impact of this, people's awareness has been increased about organic farming. Therefore, a present study has been undertaken to compare the economic viability and impact on livelihood and income of organic and inorganic cultivation of Black Cumin (Kalonji) in Nadia District of West Bengal.

2.1 Objectives

1. To assess the socio-economic status of organic and inorganic Black Cumin (Kalonji) growers
2. To compare the input use pattern in organic and inorganic Black Cumin (Kalonji) cultivation
3. To estimate the cost and return structure of organic and inorganic Black Cumin (Kalonji) cultivation
4. To evaluate the impact of organic and inorganic Black Cumin (Kalonji) cultivation on income of farmers.

2.2 Scope of Research

Here in this study the main emphasis is given to understand about the farmers perspective to choose organic or inorganic cultivation of Black cumin in Nadia district of West Bengal. The main motto of the study is to compare the cost and return structure of black cumin cultivation. Also to understand, the reason behind organic farmers are choosing organic farming and also inorganic farmers are choosing inorganic farming without harming their view point of their income. In the study area, it has been noticed that people have different concepts about farming. The organic farmers are very much concerned about their health and soil of the field. They choose to do organic farming not for any reason of forces but for their own sake of good health. On the other hand, the inorganic farming farmers use chemical pesticides for the purpose of getting higher production and ultimately higher income. To understand the perspectives of the inorganic farmers is quite different from others. For them only income is the necessary object of farming. Such comparative economic analysis study on organic and inorganic farming will help to find out the reason for doing organic or the inorganic Black Cumin cultivation in Nadia District of West Bengal. There are less research studies on comparative economic analysis of organic and inorganic black cumin cultivation. So, this research study is to do the comparative economic analysis of actual expenditure and returns structure in organic and inorganic cultivation of black cumin and why the farmers are doing that farming. In this concern we can see the difference between two types of farming but the research study viewpoint is to understand why they are doing that particular farming.

3 Review of Literature

Samima et. al., 2018, studied the effect of date of sowing on productivity of Black Cumin. The experiment was carried out during rabi season during 2016-2017 at Malda District of West Bengal ascertain the best sowing date to get high yield and quality. The study consisted of four different sowing dates like T1 -Cultivation of Black Cumin in mid-September, T2- Cultivation of Black Cumin in end of September, T3 -Cultivation of Black Cumin in mid-October, T4- Cultivation of Black Cumin in early November, T5: Farmers practice (October- November). The difference in the dates of sowing had significant influence on the yield of the crop. The yield of Black Cumin sown in mid-October reported highest B: C ratio i.e. 1:1.96 and followed by sown during early Nov. shows B: C ratio 1: 1.64. Lowest B:C ratio reported in mid-September sown black cumin.

Evangelia et.al., 2020 conducted a case study on an existing farm to determine the prospects of N. sativa production in Greece and to assess the economic outcomes of the cultivation of this crop under organic and conventional cropping systems. The total production cost of organic N. sativa seeds was 6.09 €/kg, while the cost of conventional seeds was 4.77 €/ kg. The organic and conventional Black cumin (N. sativa) seed selling prices were 17.04 and 12.01 €/kg, respectively. Moreover, the financial performance of farms is better after the introduction of N. sativa crop under organic cropping system, where the net profit increased by 63.8percent compared to the initial profit of the farm, while the increase in the conventional was less at 49.2percent. N. sativa constitutes an alternative crop for enhancing farmer incomes, especially under organic cropping.

Anil et.al., 2021, undertook the study on foliar application of different elicitors and manual pinching in black cumin during Rabi seasons of 2018-19 and 2019-20 with an objective to study the cost-economics of elicitors in black cumin cultivation. The results of the investigation inferred that, the maximum gross returns (Rs 3,49,500 ha-1) and net returns (Rs. 3,05,974 ha-1) was from black cumin plants applied with salicylic acid at 50 ppm resulting in highest B:C ratio of 8.02. While, the treatment involving the application of ancymidol at 50 ppm had an inferior effect and resulted in least net returns of Rs 1,21,248 ha-1 with a B:C ratio of 2.64, owing to its high cost of cultivation due to high price of chemical.

4 Methodology

The study has been confined to Nadia district of West Bengal. In Nadia district, government and non-government organizations are working simultaneously to promote organic farming. In the Nadia district of West Bengal, NGO like SwitchON foundation motivates farmers for adopting organic farming by conducting training. A research was conducted on the black cumin cultivation in the district to understand its socio-economic impact of organic vs conventional farming. For the study required primary data was conducted for the Rabi season of 2022 from the Black Cumin (Kalonji) growing areas of Nadia District of West Bengal. Multistage sampling was adopted for required data collection. In the first stage, a particular district was selected purposely for study.

In the second stage, Hanshkhali and Krishnagar-1 blocks were selected purposively from Nadia district on the basis of the highest area under the Black Cumin (Kalonji) in Rabi season. In the third stage, 5 villages namely Gopalpur and Itabaria from Hanshkhali block and Hijuli, Mahishnengra and Goalpara from Krishnagar-1 block were selected on the basis of the highest area under crop. In the fourth stage from each of the villages, a list of organic and inorganic Black Cumin (Kalonji) growers was obtained. The sample size consisted of 10 organic black cumin growers and 10 inorganic black cumin growers have been selected.

4.1 Methods of data collection

The primary data have been collected by personal interview from the selected Black Cumin (Kalonji) growers using a pre-tested questionnaire specially prepared for this purpose. As per the objectives of the study, for comparative analysis of selected Black Cumin (Kalonji) growers was categorized into two groups as organic and inorganic growers. The reference period of the study is Rabi season of 2022-23. Different aspects of farm operation have been obtained for both organic and inorganic farming systems.

These aspects are-

i) Record of socio-economic profile of organic and inorganic farmers,
ii) Season wise record of crops both in organic and inorganic farms,
iii) Input and output record of both organic and inorganic farms,
iv) Cost of cultivation as well as cost of production record for different crops of both group of farmers,
v) Input uses record both in organic and inorganic farms.

4.2 Data Analysis

The comparative economics of selected farmers is worked out using different cost concepts. The cost concepts used as follows:

Cost 'A' Includes the costs on account of hired human labour, bullock labour, machinery charges, value of manures, value of fertilizers, value of seed, irrigation charges, plant protection charges, land revenue, depreciation and repairs, interest on working capital etc.
Cost 'B' Rental value of land and interest on fixed capital represent imputed cost which is added to the Cost 'A'.

Cost 'B' = Cost 'A' + rental value of land + interest on fixed capital. Cost 'C' It is the total cost of production, which includes all the costs items, actual as well as imputed. The value of owned labours is imputed and added to cost 'B' to work out cost 'C'. Cost 'C' = Cost 'B' + imputed value of family labour.

FIG.1. DATA COLLECTION PHOTOS:

5 Result and Discussion

5.1 Socio-economic characteristics of selected sample organic and inorganic farmers

The socio-economic characteristics of the sample organic and inorganic farmers would provide the background information and resource endowment position of the farmers in the selected study area from the Nadia district of West Bengal. This includes the information about composition of family, size of land holding, cropping pattern, the number of livestock, etc. These factors are crucial for bringing about desirable changes in the farm economy. From Table 1 it is observed that the average family size of organic farmers is 5 and inorganic is 4.7 persons. The overall average family size is 4.9 persons. Thus, the average family size of organic farm households is found to be little higher as compared to inorganic farm households of the entire study area (Table 1). Turning to land holdings, it appears that the average size of land holdings under organic farming of the selected farm households is 2.04 acres land under inorganic farming is 1.66 acres. The overall average size is 1.85 acres per farm. Family type is seen to join as well as nucleolus in both the organic and inorganic farm households.

TABLE NO. 1. FAMILY MEMBERS AND LAND SIZE OF THE SAMPLE FARMS.

Particulars	Organic Farms	Inorganic Farms	Overall
Total family members (Per farm)	5.00	4.70	4.85
Land holding (acre)	2.04	1.66	1.85

5.1.1. Age and education distribution

Table 2. shows the age and education levels of the sample organic and inorganic farmers during the survey from Nadia district of West Bengal. From table 2 it is observed that the majority of the total farmers (65 percent) are in the age group of 40-50 years, followed by the age group of above 50 years (20 percent). About 15 percent farmers come under the age group of 30 – 40 years, while there were no farmers under the age group of 20-30 years. The table also shows that the number of illiterate farmers is seven (35 percent) and the number of farmers with high school education is nine (45 percent), higher secondary is three (15 percent) and only one has college education.

As a comparative view on Black cumin growers in the study area, under organic farming, the majority (70 percent) of the farmers are in the age group of 40-50 years, followed by 20 percent in the age group of 30-40 years. The remaining 10 percent of the farmers belong to the age groups above 50 and not a single farmer is found in the age group of 20 -30 under organic Black Cumin farming. About 50 percent of the organic farmers had high school education, followed by 30 percent illiterate farmers in the study area. Remaining 20 percent farmers with higher secondary education and college level respectively. On the other hand, under inorganic farming, 60 percent (i.e., majority) of the farmers are in the age group of 40-50 years, followed by 30 percent under above 50 years of age group. Most of the inorganic farmers (40percent) also have high school education, similarly there are 40 percent illiterate farmers among the inorganic farmers. Remaining 20 percent farmers with higher secondary level.

TABLE. 2. AGE AND EDUCATION LEVELS OF FARMERS

Sl. No.	Particulars	No. of Farmers		Total Farmers
A.	Age in Years	Organic	Inorganic	
1.	20 - 30	0 (00)	0 (00)	0 (00)
2.	30 - 40	2 (20)	1 (10)	3 (15)
3.	40 - 50	7 (70)	6 (60)	13 (65)
4.	Above 50	1 (10)	3 (30)	4 (20)
	Total	10 (100)	10 (100)	20 (100)
B.	Education Level			
1.	Illiterate	3 (30)	4 (40)	7 (35)
2.	High School	5 (50)	4 (40)	9 (45)
3.	Higher Secondary School	1 (10)	2 (20)	3 (15)
4.	College	1 (10)	0 (00)	1 (05)
	Total	10 (100)	10 (100)	20 (100)

Note: Values in brackets show percentages

5.1.2. Land Utilization Pattern

From table 3 it is observed that the average land holding of Black cumin growers in the study area is 1.77 acre per farmer, most of the farms are under irrigation. Under organic farming the average size of total land holding is 1.98 acre and under inorganic it is 1.55 acre per farmer respectively. Permanent fallow found to be nil in overall and both the farms i.e., organic and inorganic farms. Most of the farmers having their own land for cultivation, excluding some farms under organic are found to be leased in. No farmer had given their land on lease i.e., leased out, which means all farmers in the study area are cultivating their own land by themselves.

TABLE 3. LAND UTILIZATION PATTERN OF THE SAMPLE ORGANIC AND INORGANIC FARMERS

Particulars	**Organic**	**Inorganic**	**Overall**
Total (acre)	1.98	1.55	1.77
Dry (acre)	0.00	0.00	0.00
Irrigated (acre)	1.98	1.55	1.77
Permanent Fallow (acre)	0.00	0.00	0.00
Own land acre	1.14	1.55	1.34
Leased/shared in land	0.20	0.00	0.10
Leased/shared out land	0.00	0.00	0.00
Operated land (own land+leased/shared in-leased/shared out land)	2.09	1.55	1.82

5.1.3. Cropping Pattern

In table 4 here we can see the major crops sown and average area under crops in both organic and inorganic farming. It can be seen that the organic farming area in Kharif season is high whereas in the inorganic farming it is quite less than the organic one. But in case of Rabi season and annual crops, the area under inorganic farming is high as compared to organic farming. In both the organic and inorganic farming there is no cultivation in the summer season. In case of major crops grown in kharif season are the same i.e., Miniket Rice, White Swarna Rice, Black Rice, Gobindobhog Rice, Pratikshya Rice, Jute, Sesamum etc., under organic as well as inorganic farming. Similarly in rabi season also farmers are growing the same crops i.e., Black Cumin, Boro Rice, Wheat, Mustard, Lentil, Gram etc. under organic as well as inorganic farming.

TABLE 4. MAJOR SEASON AND CROPS UNDER ORGANIC AND INORGANIC FARMING

Season	**OrganicAve Area (acre)**	**InorganicAve Area (acre)**	**Major Crops**
Kharif	0.72	0.70	Miniket Rice, White Swarna Rice, Black Rice, Gobindobhog Rice, Pratikshya Rice, Jute, Sesamum etc.
Rabi	0.42	0.45	Black Cumin, Boro Rice, Wheat, Mustard, Lentil, Gram etc.
Summer	0.00	0.00	Nil
Annual	0.23	0.33	Flowers crops

5.1.4. Livestock's status of organic and inorganic black cumin growers

Alternative sources of livelihood options are equally important to make any livelihood sustain for longer time periods. From the study area's point of view livestock rearing is one of the best alternative livelihood options which contributes to the sustainable & secure flow of incomes. Table number 5 shows that most of the farmers are rearing cows, poultry and goats. Poultry rearing is dominant because it has no need for giving food separately for them as these are left in the surrounding of the house premises. Here it can be seen that organic farmers believe in more livestock rearing as it helps them to produce different kinds of manures which ultimately saves the cost of production. In the village rearing of animals is considered as one of the alternative occupations of the villagers.

TABLE 5. AVERAGE NUMBER OF ANIMALS PER FAMILY

Particulars	**Organic**	**Inorganic**
Draft Animal	0	0
Cow	3	1
Buffaloes	0	0
Goat	1	2
Sheep	0	0
Poultry	4	3

6 Input use pattern under organic and inorganic **Black Cumin Cultivation**

The quantities of inputs applied for cultivation of the Black Cumin (organic and inorganic) per acre are shown in table 6.

TABLE 6. PER ACRE INPUT USE PATTERN UNDER ORGANIC AND INORGANIC BLACK CUMIN CULTIVATION

Particulars	Organic		Inorganic	
	Units / Name of Material	Qty	Units / Name of Material	Qty
Human Labour	Man Days	80.55	Man Days	73.59
Bullock Labour	Pair days	4.29	Pair days	4.29
Machine Labour	Hours	9.14	Hours	7.43
Seed Treatment	Trichoderma viride (gm)	492.79	Bavistin (gm)	7.82
Seed	kg	5.05	kg	4.39
Fertilizers	-	0.00	Mix Fertilizer (kg)	153.98
Compost/ Manures	FYM (kg)	5142.49	-	0.00
	Vermicompost / Mustard Cake (kg)	62.21	-	0.00
Plant Protection	Trichoderma viride (gm)	1782.00	Chemicals (gm)	88.01

6.1.1. Human Labour

The average per acre requirement of human labour for inorganic black cumin cultivation is 80.55 mandays, while for inorganic cultivation it is 73.59 mandays per acre. There is a difference of 6.96 human labour mandays between organic and inorganic black cumin cultivation. Which means that organic black cumin cultivation requires a greater number of human labours as compared to inorganic cultivation. Because under organic cultivation of black cumin farmers required more manpower for application of inputs like FYM, Trichoderma viride and other intercultural operations like hand weeding.

6.1.2. Bullock labour

Bullock labour used per acre is almost the same, i.e., 4.29 pairs each for both the organic and inorganic black cumin cultivation.

6.1.3. Machine labour

In case machine labour, which is measured on an hourly basis table, shows that organic black cumincultivation requires quite more of machine labour as compared to inorganic cultivation.

6.1.4. Seed treatment

Materials used for seed treatment includes the Trichoderma viride under organic black cumin cultivation, while Bavistin chemical under inorganic cultivation. Average per acre quantity of Trichoderma viride required for seed treatment is found to be 492.79 gm under organic black cumin cultivation. On the other hand, under inorganic cultivation the average per acre quantity of Bavistin required for seed treatment is just 7.82 gm. On an average, 5.05 kg and 4.39 kg seeds per acre are respectively required for inorganic and organic black cumin cultivation.

6.1.5. Fertilizers

Chemical fertilizers applied by the inorganic farmers is 153.98 kgs per acre, whereas the organic black cumin cultivating farmers have not used any fertilizer.

6.1.6. Compost and manures

In the compost and manures organic black cumin cultivating farmers have applied 5142.49 kg of FYM and 62.21 kg of vermicompost or mustard cake. While inorganic black cumin cultivating farmers have not applied FYM and vermicompost or mustard cake. Result also shows a substantial difference between organic and inorganic black cumin cultivation in the use of manures and chemical fertilizers.

6.1.7. Plant Protection

On an average 1782 gm of Trichoderma viride are used to spray for protecting black cumin crop by organic farmers group, but inorganic farmers used chemicals 88.01 gm to spray. This difference appears highly significant.

Among all the inputs, the highest and significant difference is found while applying inputs like manures and fertilizers (chemical for inorganic and organic manure for organic black cumin cultivation).

6.2. Comparative cost of cultivation of organic and inorganic black cumin production

Cost of cultivation comprises expenditures on inputs incurred by a farmer to achieve the final output. Basically, the costs incurred by a farmer are of two types i.e., variable or operational cost and fixed cost. Variable cost is the cost incurred by a farmer on factors of production such as seeds, human labour, fertilizers, pesticides, bullock labour, livestock feed, tractor fuel, etc. Fixed cost is the cost incurred on land rent, taxes, depreciation of implements and machinery, interest, insurance premium, etc. So, different cost components viz. hired human labour, family labour, machine labour, seed cost, plant protection materials, fertilizer, interest on working capital, land revenue, rental value of owned land, depreciation and interest on fixed capital were taken into consideration for the present study. The cost has been determined on the basis of standard cost concepts namely, Cost A, B, and C. The different cost concepts have different utilities. Here an attempt has been made to estimate the comparative cost of cultivation of organic and inorganic black cumin cultivation in the study area presented in Table 7.

TABLE 7. PER ACRE COST OF CULTIVATION OF ORGANIC AND INORGANIC BLACK CUMIN PRODUCTION

Sl. No.	Cost Components	Organic Farmers		Inorganic Farmers	
		Value in Rs	percent	Value in Rs	percent
1	Hired Human labour	3286.80	7.25	3227.40	6.91
2	Bullock labour	1155.00	2.55	1155.00	2.47

Sl. No.	Cost Components	Organic Farmers		Inorganic Farmers	
		Value in Rs	percent	Value in Rs	percent
3	Machine labour	2745.60	6.06	2227.50	4.77
4	Seed	1511.40	3.34	1320.00	2.82
5	Chemical fertilizer	0.00	0.00	5060.02	10.83
6	Organic manure	2548.13	5.62	0.00	0.00
7	Plant protection	333.43	0.74	2200.01	4.71
8	Land revenue	0.00	0.00	0.00	0.00
9	Depreciation	936.11	2.07	1200.67	2.57
10	Interest onworking capital	750.98	1.66	983.43	2.10
11	Cost A (Σ item 1 to 10)	13267.45	29.28	17374.04	37.17
12	Interest on fixedcapital	9973.29	2.64	9387.11	2.41
13	Rental value of land	1196.81	22.01	1126.46	20.08
14	Cost-B (Σ item 11 to 13)	24437.56	53.93	27887.61	59.67
15	Family human labour	20879.10	46.07	18849.60	40.33
16	Cost-C (Σitem 14 to 15)	45316.66	100.00	46737.21	100.00

6.3. Total variable cost per acre (Cost A)

The table 7 shows that the total variable cost per acre (Cost A) is observed to be higher for inorganic black cumin cultivation (Rs. 17374.04) as compared to the organic (Rs. 13267.45). Cost A contributes 37.17 percent expenditure under inorganic black cumin cultivation, which is nearly 8 percent higher than organic black cumin cultivation (29.28 percent). Under inorganic cultivation of black cumin use of chemical fertilizers increases the expenditure up to 10.83 percent (Rs. 5060.02 per acre) as compared with organic cultivation of black cumin. Means by adopting organic package of practices black cumin cultivators can save average per acre cost of chemical fertilizers.

6.3.1. Labour costs

When observed into each input costs in particularly all labour costs i.e., human labour cost which includes hired human labour 7.25 percent and family labour 46.07 percent, then bullock and machine labour are observed to be more for organic farmers. As per black cumin growers comments from the study area, organic farmers require more labour for intercultural operations like weeding and plant protection activities. However, expenditure on human labour accounted for a major share of the total cost i.e., 53.33 percent for organic and 47.24 percent for inorganic black cumin, followed by rental value of land, which constituted 22.01 percent for organic and 20.08 percent for inorganic black cumin.

6.3.2. Seed costs

It is also observed that the organic black cumin growers in Nadia district of west Bengal are using more quantities of seeds. Cost of seeds for organic growers is found to be 3.34 percent of total cost is quite higher than inorganic black cumin growers (2.82 percent).

6.3.3. Cost of manure and chemical fertilizers

The major cost share were chemical fertilizer 10.83 percent for inorganic black cumin and manure cost 5.62 percent for organic black cumin cultivation. Cost required for purchase of chemical fertilizers was observed to be double than organic manures.

6.3.4. Cost of plant protection

In case of plant protection practices, inorganic black cumin requires additional cost i.e., 4.71 percent for purchase of plant protection chemicals which includes herbicide, insecticide, pesticide and fungicides etc., on the other hand, under organic black cumin cultivation it was just 0.74 percent of total cost.Therefore if black cumin growers in the study area adopt organic farming practices, they can save these costs. The cost structures of organic and inorganic black cumin cultivation are picturised in Figure 2.

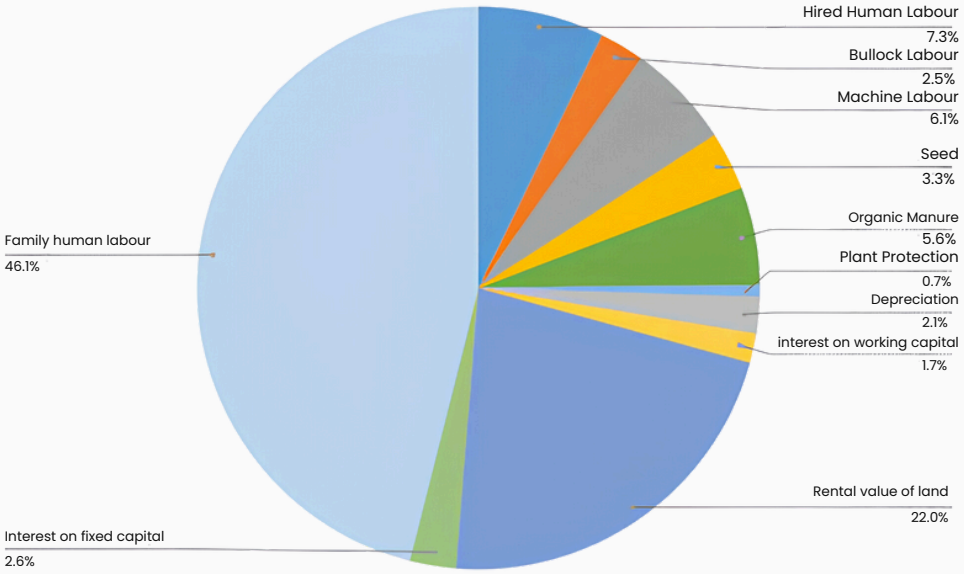


FIGURE 2. COST STRUCTURES OF ORGANIC BLACK CUMIN CULTIVATION

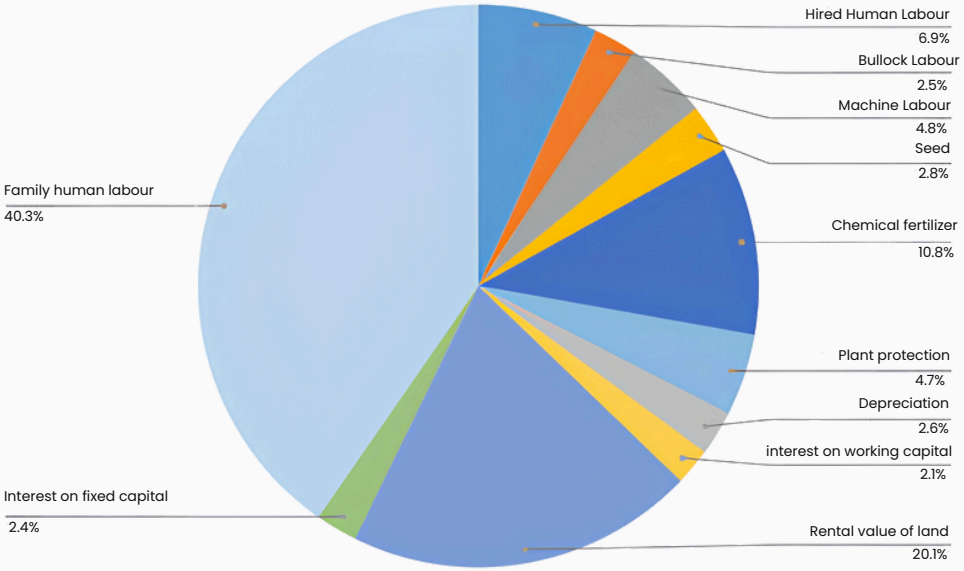


FIGURE 3. COST STRUCTURES OF INORGANIC BLACK CUMIN CULTIVATION

6.4. Economics of organic and inorganic black cumin production in Nadia district of West Bengal

The benefit cost ratio in the cultivation of black cumin in the study area indicates the returns received per rupee invested. The economics includes the output level i.e., yield per acre, gross income in Rs., total cost of cultivation, net returns, per kg cost of production and B:C ratio, which are summarized in Table 8.

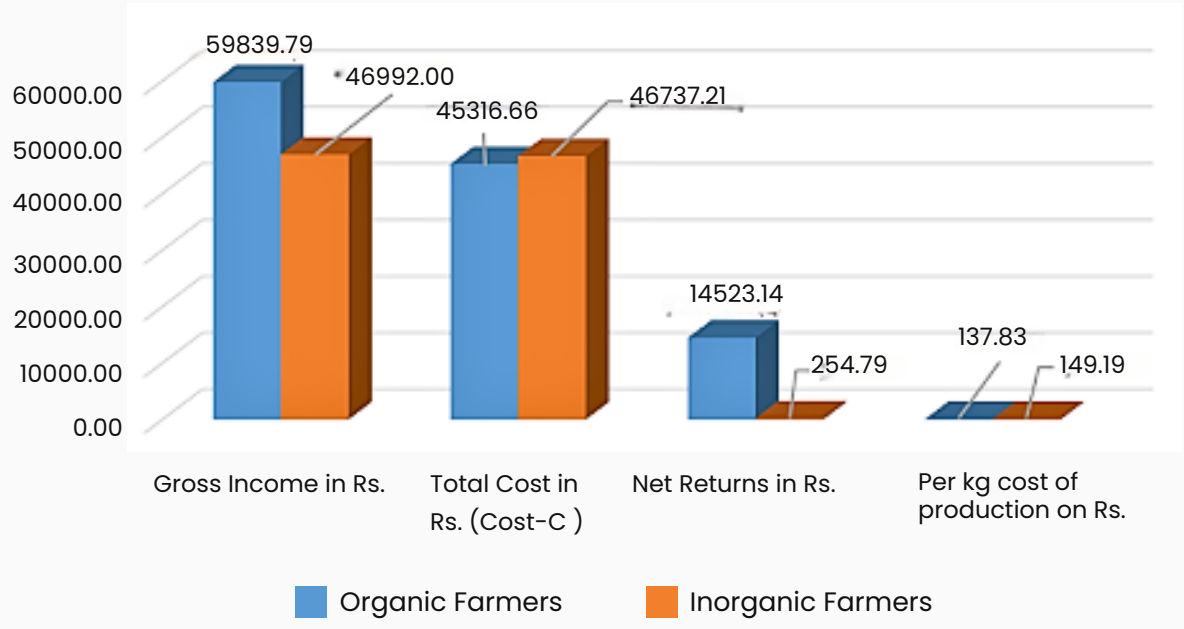
TABLE 8. PER ACRE ECONOMICS OF ORGANIC AND INORGANIC BLACK CUMIN PRODUCTION

Particulars	**Organic**	**Inorganic**
Yield (Kg / Acre)	328.78	313.27
Gross Income in Rs.	59839.79	46992.00
Total Cost in Rs. (Cost-C)	45316.66	46737.21
Net Returns in Rs.	14523.14	254.79
Per kg cost of production is Rs.	137.83	149.19
B:C Ratio	1.32	1.01

The perusal of Table 8. revealed the yield per acre in kgs, gross returns, total cost or cost of cultivation, net returns over total cost and B: C ratio. The organic black cumin yielded 328.78 kg per acre, which brings a revenue of Rs. 59839.79. As these selected organic black cumin growers are following an organic package of practices since last decade, therefore they are getting better yield levels than inorganic black cumin growers in the study area. The total cost incurred was Rs. 45316.66, leading to a net income of Rs. 14523.14 per acre. Which is found to be 98.25 percent more net return than inorganic. On the other hand, the inorganic black cumin yielded 313.27 kg. per acre and earned a revenue of only Rs. 46992.00, leading to a net income of just Rs. 254.79 per acre, which is found to be less. Per kg cost of production is found to be more in inorganic black cumin cultivation (149.19 Rs per kg).

For both organic and inorganic black cumin cultivation, the benefit cost ratio shows the profitable income to farmers. B:C to ratio for organic and inorganic black cumin found to be 1.32 and 1.01 respectively. Thus, organic black cumin has performed better than inorganic in terms of both total yield and profit earned per acre in Nadia district of West Bengal. As these organic black cumin growers sold their output directly to ONganic Foods so they get better price for their output as compare to market prices. The economics of organic and inorganic black cumin cultivation are picturised in Figure 3.

FIGURE 4. ECONOMICS OF ORGANIC AND INORGANIC BLACK CUMIN PRODUCTION (PER ACRE)



7 Conclusion

The cost structure clearly showed that the cultivators of organic black cumin employed relatively a greater number of labourers and incurred a higher labour cost than the inorganic black cumin farmers in the study area. So, in order to make organic black cumin cultivation economically viable, labour requirements need to be reduced to decrease labour cost through selective mechanisms. There is a need to draw attention towards cultivating black cumin through organic farming and help the organic farmers to earn more in order to improve their standard of living. The study shows that inorganic cultivation of black cumin cultivation is not that much economically profitable compared to organic. Thus, the government needs to support the farmers to meet the labour requirements through formulation of a package for adopting advanced mechanisms.

8 References

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9 Appendix

QUESTIONNAIRE

Topic: A Comparative Economic Analysis of organic and inorganic cultivation of Black Cumin (Kalonji) in Nadia District, West Bengal

Name of Researcher:

Name of farmer: **Mobile No.**

Organic cultivator/ Inorganic cultivator

1. SOCIO-ECONOMIC STATUS

1.	**Date of interview**	
2.	Name of the main crop referred for the survey	
3.	Country	India
4.	State	West Bengal
5.	District	Nadia
6.	Taluka/Block	
7.	Village	
8.	Farm size (Small less than 1 ha, Medium 1-2 ha & Large more than 2ha)	
9.	Land holding	
10.	Total family member	
11.	Family type (Joint/Nucleolus)	

2. GENERAL FAMILY INFORMATION

Sl. No.	Name	Gender	Age	Education	Occupation	Annual Income (Rs.)	Remark
1.							
2.							
3.							
4.							
5.							
6.							
7.							

3. LAND INVENTORY

Particulars	Dry (acres)	Irrigated (acres)	Permanent Fallow (acres)	Total (acres)
Own land				
Leased/shared in land				
Leased/shared out land				
Operated land (own land+ leased/shared in- leased/shared out land)				

4. CROPPING PATTERN

Total area (ha)	Kharif			Rabi			Summer			Annual	
	Name of crop	Dry (ha)	Irri. (ha)	Name of crop	Dry (ha)	Irri. (ha)	Name of crop	Dry (ha)	Irri. (ha)	crop	Irri. (ha)

5. LIVESTOCK

Type	Quantity (No)	Present total value (Rs.)
1. Draft animals		
2. Cows		
3. Buffaloes		
4. Goat		
5. Sheep		
6. Poultry		
7. Others		

6. FARM IMPLEMENTS

Particulars	Quantity (No)	Present total value (Rs.)
1. Tractor		
2. Harvesters		
3. Threshers		
4. Shellers		
5. Sprinkler sets		
6. Drip irrigation		
7. Bullock Cart		
8. Electric Pump set		
9. Diesel Pump set		
10. Manual sprayers		
11. Power sprayers		
12. Others		

7. FARM BUILDING/RESIDENTIAL STRUCTURE

Particulars	Quantity (No)	Size (Sq.feet)	Present total value (Rs.)
1. Residential House			
2. Farm house			
3. Cattle shed			
4. Poultry shed			
5. Engine pump house			
6. Others (Specify)			

8 LABOUR USE PATTERN

Name of Crop: Variety:	Area Under Crop:	Irrigation Method:		Date of Sowing:
Date of Harvesting:		Sowing method:	Spacing:	Soil type:

Sr.No	Operations	Human Labour required days				Bullock required (pair days)		Machinery (hrs.)	
		Owned		Hired					
		M	F	M	F	Owned	Hired	Owned	hired
A)	Preparatory tillage								
1)	Rotavator/ Ploughing								
2)	Harrowing								
3)	Bed preparation								
4)	Othersa. Cultivatorb. Tillering								
B)	Seed treatment								
C)	Farm management								
1)	Sowing								
2)	Irrigation-								

D)	Intercultural operations								
1)	Weeding								
2)	Hoeing								
3)	Earthing up								
E)	Fertilizer Application								
F)	Plant protection chemical / Organic material Application/ Practices								
G)	Supervision								
H)	Harvesting								
I)	Threshing								
J)	Transport								
1)	Farm to store								
k)	Land Revenue								
I)	Others								

9 INPUT USE PATTERN

1	**Seed Treatment Chemicals / Organic material**							
	a)							
	b)							
	c)							
	d)							
	e)							
	f)							
	g)							
2	Seed / Planting Material							

3	Fertilizers								
	a) Nitrogen (N)	Urea							
		DAP							
		Complex							
		Others i.							
		ii.							
		iii.							
	b) Phosphorus (P)	SSP							
		DSP							
		Others i.							
		ii.							
		iii.							
	c)Potassium (K)	MOP							
		Others i.							
		ii.							
		iii.							
	d) Compost/Manures	FYM							
		Vermicompost							
		Green Manuring							
	e) Micronutrients	i.							
		ii.							
		iii.							
		iv.							

4	Plant Protection Chemicals / Organic material								
	Herbicides forWeed Control	i.							
		ii.							
		iii.							
	Insecticides/Pesticides for Insect-Pest Control	i.							
		ii.							
		iii.							
	Fungicides for Disease Control	i.							
		ii.							
		iii.							
5	Others / Plant Growth Regulatorsi.								
	ii.								
	iii.								

10. PRODUCTION

A	**Main produce**		
	Quantity (Kg/qtls)	Rate (Rs/qtls)	Total value (Rs.)
B	**By produce**		
	Quantity (Kg/qtls)	Rate (Rs/qtls)	Total value (Rs.)
C	Gross Produce (Rs) (A+B)		

BLACK CUMIN

Nadia, West bengal

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