



ISSN (E): 2277-7695

ISSN (P): 2349-8242

NAAS Rating: 5.23

TPI 2023; 12(7): 3276-3279

© 2023 TPI

www.thepharmajournal.com

Received: 03-05-2023

Accepted: 17-06-2023

Dasari Avinash Kumar

Research Scholar, School of Agri-Business Management, PJTSAU, Rajendranagar, Hyderabad, Telangana, India

Bandumula Nirmala

Senior Scientist, ICAR-Indian Institute of Rice Research (IIRR), Rajendranagar, Hyderabad, Telangana, India

Desireddy Srinivasa Reddy

Field Officer, CCS, Department of Agricultural Economics, College of Agriculture, PJTSAU, Rajendranagar, Hyderabad, Telangana, India

Aadmala Meena

Assistant Professor, Department of Statistics and Mathematics, PJTSAU, Rajendranagar, Hyderabad, Telangana, India

Corresponding Author:

Dasari Avinash Kumar

Research Scholar, School of Agri-Business Management, PJTSAU, Rajendranagar, Hyderabad, Telangana, India

Profit potential of black rice cultivation in Telangana state

Dasari Avinash Kumar, Bandumula Nirmala, Desireddy Srinivasa Reddy and Aadmala Meena

Abstract

The research was carried out in the Telangana districts of Siddipet and Mancherial. In the study area, Telangana sona is the popular variety grown where black rice is cultivated. For the study, data were collected from 40 black rice producing farmers and 40 popular rice variety producing farmers from the Siddipet and Mancherial districts of Telangana. Generally, most farmers belong to the small farmer category in the Black rice and Telangana sona variety. The total variable cost for Black rice and Telangana sona variety is Rs. 57,670 ha⁻¹ and Rs. 61,106 ha⁻¹, respectively. There is not much variation in fixed costs between both varieties. The overall cost of cultivation for Black rice is Rs. 81,306 ha⁻¹ and Rs. 84,665 ha⁻¹ for Telangana sona variety. Net income was highest in Black rice (Rs.79,957 ha⁻¹) compared to the Telangana sona variety (Rs.48,676 ha⁻¹). The results indicate that Black rice has a cost and return advantage over the Telangana sona variety in Telangana state.

Keywords: Black rice, costs, returns, Telangana sona, Telangana

Introduction

In India, rice is grown in 43.91 million ha, the production level is 118.43 million tonnes and the productivity is 2499.96 kg ha⁻¹ (Agricultural Statistics at a Glance, 2020) [5]. It is cultivated in a variety of soil and climatic conditions. Rice productivity in India is low compared to many other countries worldwide. Furthermore, almost 90% of rice cultivated land belongs to marginal, small, and medium farmers, which is a key constraint in boosting rice yield in the country. China has the highest rice productivity of 6710 kg ha⁻¹, followed by Vietnam (5573 kg ha⁻¹), Indonesia (5152 kg ha⁻¹) and Bangladesh (4375 kg ha⁻¹) (National Food Security Mission, 2016) [8]. There are better technology and other interventions that might be implemented to boost the country's production. Hybrid rice agriculture has the potential to boost productivity and should be encouraged.

Black rice, also known as "Forbidden Rice" or "Emperor's Rice," is a type of rice that is popular in India and other parts of Asia. It is known for its unique colour, texture, and health benefits. Black rice is considered a whole grain and is a good source of fiber, antioxidants, and vitamins. It is also gluten-free and has a low glycemic index, making it suitable for people with diabetes.

In India, black rice is grown in the north-eastern states, such as Assam and West Bengal. It is traditionally grown as a rain-fed crop and is often intercropped with other crops, such as vegetables and legumes. Black rice is used to make a variety of dishes, including desserts, porridge, and steamed rice dishes. It is also used to make fermented foods, such as Idli and Dosai, which are popular breakfast dishes in South India.

In recent years, black rice has gained popularity in India and other countries due to its health benefits and unique flavour. It is now widely available in specialty stores and online, and is often more expensive than other types of rice due to its lower yields and more complicated processing methods. Despite this, it remains a popular and valued ingredient in Indian cooking and is a staple food in many parts of the country.

By selling one kilogram of black paddy farmers are able to earn Rs.43.96 and from black rice is Rs. 90.32 kg⁻¹. From the revenue earned per kg, it can be said that they are earning a good sum of money. The growers are carrying black rice cultivation, not on a commercial basis they are cultivating to meet their needs and if the production is exceeded the cultivation limit, then they use it to sell in the local market. The economies of scale can meet if the cultivators start cultivation of black rice on a commercial basis, thus it will reduce their costs up to a certain

extent and will improve their profitability (Sharma, 2019) ^[10]. Black rice is available at Walmart and supermarkets. It is produced through organic agriculture and sells for Rs 400 kg⁻¹. The extension and spread of black rice will help farmers boost their revenue, and it has been established that the nutritional properties of black rice keep diseases like cancer at bay and will help ordinary people maintain their health. Black rice had an input-output ratio of 2.01. It shows that black rice farming was profitable. (Shende, N.V., 2020) ^[11]. The aim of this research is to analyse the profit potential of black rice cultivation in Telangana state.

Materials and Methods

The present study was conducted in Telangana state. In Telangana state, Siddipet and Mancherial districts are purposively selected as they are major black rice producing districts in Telangana. For the study, data were collected from 40 black rice producing farmers and 40 popular rice variety producing farmers in the study area of Siddipet and Mancherial districts of Telangana. Two mandals were chosen from each district, with ten black rice cultivating farmers and ten popular rice variety growing farmers chosen from each mandal using a snowball sampling approach. The data from the farmers was collected with regard to the Kharif season of the 2021-22 agricultural year. Data related to general information of farmers were collected and details of the various materials used in rice cultivation, such as chemical fertilizers, crop protection chemicals, seed material and labour, and cultivation methods such as land preparation, transplanting, irrigation, inter-cultural breeding and harvesting; labour requirements, etc. were collected. The information was gathered using a personal contact method and a pre-planned interview schedule. The data was categorised, tabulated, and analysed in light of the objectives and to make the findings practical.

The cost of cultivation

For ease of comparison, the collected data were given in tabular form. The standard cost concept were used to get the desired cost and return structure and presented in tabular presentation. The data is summarized the using statistical tools like averages, percentages, etc. to achieve relevant findings.

Analysis of data

The data collected is tabulated and analyzed using appropriate statistical tools like cost concepts which are mentioned below.

Cost concepts

Cost concepts (Cost A1, Cost A2, Cost B1, Cost B2, Cost C1, Cost C2 and Cost C3) were calculated to work out the cost of cultivation.

- Cost A1: This Cost includes the value of hired human labour, owner and hired bullock labour, owned and hired machine labour, seeds, fertilisers, farmyard manure, plant protection chemicals, depreciation, land revenue and interest on working capital.
- Cost A2: Cost A1 + rent paid on leased land
- Cost B1: A2 + interest on owned fixed capital assets

(excluding land)

- Cost B2: Cost B1 + rental value of owned land
- Cost C1: Cost B1 + imputed value of family labour
- Cost C2: Cost B2 + imputed value of family labour
- Cost C3: Cost C2 + 10% of Cost C2.

Net returns per hectare

Net Return = Gross Return – Cost C2

A basic tabular analysis was carried out to calculate the per hectare cost of production, gross returns, and net returns.

Results and Discussions

The results are mainly obtained from the data which was collected from the respondents to know their opinion about Black rice.

1) Cost and returns from Black rice and Telangana sona variety in Siddipet and Mancherial district

The profitability of both black rice and Telangana sona in the study area was examined by calculating per hectare costs and returns. The cost of cultivation in both rice types is presented in Table 1. The expenditure incurred on seed is more for the Telangana sona variety (Rs.2,892 ha⁻¹) compared to Black rice (Rs.2,589 ha⁻¹). Total human labour cost is Rs.18,971 ha⁻¹ in Black rice whereas, Rs.20,068 ha⁻¹ in Telangana sona cultivation, which shows that there is a high labour requirement in the cultivation of Telangana sona variety compared to Black rice. The expenditure on bullock labour is almost the same in both varieties, Rs.1,193 ha⁻¹ in Black rice and Rs.1,073 ha⁻¹ in Telangana sona. Machinery cost is Rs.20,735 ha⁻¹ for Black rice and Rs.19,833 ha⁻¹ in the case of Telangana sona. Expenditure for fertilizers is nil in Black rice as none of the farmers are using fertilizers whereas, in the Telangana sona variety it is Rs.10,770 ha⁻¹. The cost of FYM is Rs.14,039 ha⁻¹ and Rs. 1,597 ha⁻¹ in Black rice and Telangana sona variety respectively. The cost of plant protection chemicals was observed to be Rs.0 ha⁻¹ and Rs.4,812 ha⁻¹ in Black rice and Telangana sona respectively. It was found that there is not much difference between proportional expenditure on machinery, fertilizers and FYM cost in the cultivation of the selected varieties. A significant difference was found in the expenditure incurred on fertilizers and plant protection chemicals. The cost of plant protection chemicals was higher in the Telangana sona paddy variety than in Black rice. The total cost of cultivation was Rs. 81,306 ha⁻¹ in Black rice and Rs. 84,665 ha⁻¹ in the Telangana sona variety which shows that the cost of cultivation is comparatively higher in the Telangana sona variety. This may be due to more expenditure on inputs like human labour, seed and plant protection chemicals in Telangana sona cultivation. The per hectare paddy output obtained by cultivation of both the selected varieties is presented in Table 2. The gross income per hectare realized was Rs. 1,64,564 ha⁻¹ and Rs.1,36,696 ha⁻¹ in Black rice and Telangana sona variety respectively. The yield of Black rice was 2.1 tonnes ha⁻¹, whereas 6.9 tonnes ha⁻¹ through the cultivation of Telangana sona.

Table 1: Cost of cultivation of Black rice and Telangana sona

Sl. No	Particulars	Black Rice	Telangana sona
		Amount (Rs ha ⁻¹)	Amount (Rs ha ⁻¹)
I	Variable costs		
1	Seed	2,589 (3.7)	2,892 (3.1)
2	Human labour	18,971 (24.6)	20,068 (23.3)
	Bullock labour	1,193 (1.5)	1,073 (0.01)
3	Machinery	20,735 (20.1)	19,833 (20.8)
4	Fertilizers	0(0)	10,770 (13.2)
5	FYM	14,039 (19)	1,597 (0.02)
6	Pesticides	0 (0)	4,812 (0.06)
7	Irrigation charges	140 (0.001)	58 (0.001)
	Total variable costs	57,670 (69.36)	61,106 (70.2)
II	Fixed costs		
9	Land revenue	100 (0.001)	100 (0.001)
10	Rental value of land	20,000 (26.6)	20,000 (25.8)
11	Depreciation	1,574 (0.01)	1,551 (0.01)
12	Interest on fixed capital	2,061 (0.02)	2,007 (0.02)
	Total fixed costs	23,636 (30.6)	23,558 (29.7)
III	Total costs	81,306 (100)	84,665 (100)

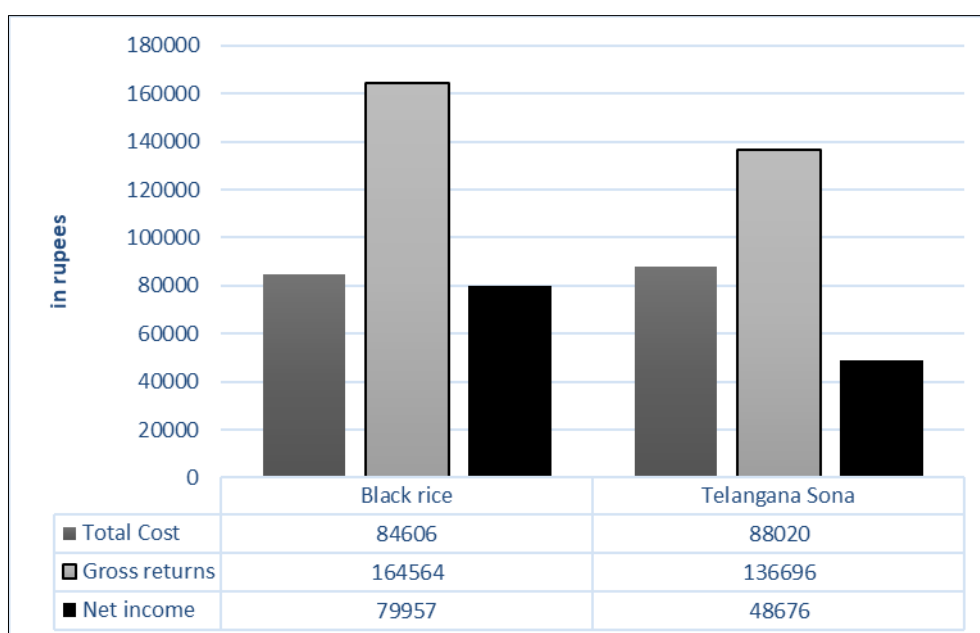
2) Cost and return details of Black rice and Telangana sona in Siddipet and Mancherial district

Table 2: Cost and return details of cultivation of Black rice and Telangana sona

Sl. No	Cost concept	Black rice (Rs. ha ⁻¹)	Telangana sona (Rs. ha ⁻¹)
1	Cost A1	59,344	62,758
2	Cost A2	79,344	82,758
3	Cost B1	61,406	64,819
4	Cost B2	81,406	84,819
5	Cost C1	64,606	68,019
6	Cost C2	84,606	88,019
7	Cost C3	93,067	96,821
8	Gross Returns	1,64,564	1,36,696
9	Net income	79,957	48,676

Cost and returns as per cost concepts of Black rice and Telangana Sona paddy variety in Siddipet and Mancherial district were presented in Table 2. It was observed that the commercial cost of cultivation (Cost C) was higher in the Telangana sona variety (Rs.96,821) compared to Black rice (Rs.93,067). Cost A1, A2, B1, and B2 were also higher in

Telangana sona compared to Black rice. The higher value of Cost A1 in the cultivation of the Telangana sona variety (Rs.62,758) than that of the Black rice variety (Rs.59,344) may be attributed to more expenditure on fertilizers and pesticides by Telangana Sona cultivating farmers.

**Fig 1:** Returns from Black rice and Telangana sona

The cost of production per quintal is found to be higher for the Black rice variety (Rs.3,952 q⁻¹) compared to the Telangana Sona (Rs.1,201 q⁻¹). The net income which represents a surplus over the total costs was found to be higher in Black rice (Rs.79,957 ha⁻¹) compared to the Telangana sona variety (Rs.48,676 ha⁻¹). Thus, farmers growing Black rice realized higher net returns compared to that of farmers growing Telangana sona variety. Higher net income reflects the degree of success of the farm business.

Conclusion

Expenditure on seed was Rs. 2,589 ha⁻¹ for Black rice and Rs. 2,892 ha⁻¹ for Telangana sona variety. Human labour cost for Black rice is Rs. 21,210 ha⁻¹ and Rs. 22,370 ha⁻¹ for Telangana sona. The cost of pesticides in Telangana sona is Rs. 4,812 ha⁻¹ whereas in black rice it is zero because no pesticides were used, as they produce them completely organic. The total variable cost is Rs. 57,670 ha⁻¹ and Rs. 61,106 ha⁻¹ for Black rice and Telangana sona variety respectively. There is not much variation in fixed costs between both varieties. The total cost of cultivation is Rs. 81,306 ha⁻¹ for Black rice and Rs. 84,665 ha⁻¹ for the Telangana sona variety.

It was found that the commercial cost of cultivation (Cost C2) was higher in the Telangana sona variety (Rs. 88,019 ha⁻¹) than Black rice variety (Rs. 84,606 ha⁻¹) and gross income was observed at Rs. 1,64,564 ha⁻¹ and Rs. 1,36,696 ha⁻¹ for Black rice and Telangana sona respectively. Net income was highest in Black rice (Rs. 79,957 ha⁻¹) compared to the Telangana sona variety (Rs. 48,676 ha⁻¹). In the end, Black rice has a cost and return advantage over the Telangana sona variety in Telangana state. Because of its better advantages, black rice is becoming increasingly popular. Farmers may meet the market demand for black rice by switching from traditional rice-growing varieties to black rice on their planted land.

Author Statement

All authors read, reviewed, agreed and approved the final manuscript. Note-All authors agreed that- Written informed consent was obtained from all participants prior to publish / enrolment.

Conflict of interest

We declare no known conflict of interests that could have appeared to influence the work reported in this paper.

Ethical Approval

This article does not contain any studies with human participants or animals performed by any of the authors.

Reference

1. Abera S, Melak A, Bekele A, Assaye A. Cost and Return Analysis of Rain Fed Lowland Rice Production under Smallholder Farmers in Fogera District, North Western Ethiopia. *International Journal of Research Studies in Agricultural Sciences*. 2019;5(3):30-35.
2. Agarwal PK, Yadav P, Mondal S. Economic analysis of cost and return structure of paddy cultivation under Traditional and SRI Method. *International Journal of Agriculture Sciences*. 2018;10(8):5890-5893.
3. Arvind M, Prashanthi SK. Comparative analysis of two predominant methods of rice sheath blight inoculation.

4. Journal of Crop and Weed. 2023;19(1):158-163.
4. Debnath S, Gupta S, Das R. Comparative performance of some rice hybrids with few elite rice inbreds in respect of their yield and yield attributing characters during boro season at new alluvial zone of West Bengal. *Journal of Crop and Weed*. 2023;19(1):191-193.
5. Directorate of Economics and Statistics, Agricultural Statistics at a Glance, 2020. [https://eands.dacnet.nic.in/PDF/Agricultural%20Statistics%20at%20a%20Glance%20%202020%20\(English%20version\).pdf](https://eands.dacnet.nic.in/PDF/Agricultural%20Statistics%20at%20a%20Glance%20%202020%20(English%20version).pdf)
6. Hamsa KR, Srikantha Murthy PS, Gaddi G. Comparison of Cost and Returns of Major Food Crops Under Central Dry Zone of Karnataka IOSR *Journal of Agriculture and Veterinary Science*. 2017;10(6):21-26.
7. Mainuddin M, Alam M, Maniruzzaman M, Kabir M, Mojid M, Hasan M. Yield, profitability, and prospects of irrigated Boro rice cultivation in the North-West region of Bangladesh. *PLoS ONE*. 2021;16(4):1-23.
8. National Food Security Mission, 2016. <https://www.nfsm.gov.in/StatusPaper/Rice2016.pdf>
9. Nirmala B, Sanjeeva Rao D, Amtul Waris. A study on economic analysis of bio fortified rice varieties. *ORYZA-An International Journal on Rice*. 2019;56(4):405-410.
10. Sharma. Cost Benefit analysis of Black Rice Cultivation in Padumani Development Block of Golaghat District of Assam, India. *International journal of basic and applied research*. 2019;9(6):910-914.
11. Shende NV, Rathod VJ, Dangore UT, Bagde NT. Economic analysis of black rice cultivation. *Journal of Pharmacognosy and Phytochemistry*. 2020;9(5):318-322.
12. Shrine S, Sunil G, Babu Asha R, Pavani A. A study on production and marketing of rice cultivation in Vizianagaram district of Andhra Pradesh, India. *Asian Journal of Agricultural Extension, Economics and Sociology*. 2020;38(2):97-101.
13. Teekendra Kumar, Chandrakar MR, Gauraha AK, Yogesh Sahu, Rashmi Jaiswal. Production, marketing and processing of black rice: A case study of Ojashvi farmer producer organization, Kurud district Dhamtari. *The Pharma Innovation Journal*. 2021;10(8):653-658.