



PROFITABILITY OF INDIGENOUS RICE PRODUCTION IN WEST BENGAL

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Introduction

Rice (*Oryzasativa* L.) is the staple food of more than 60% population of the world. Rice occupies a pivotal place in Indian agriculture and it's a source of livelihood for about 120-150 million rural households. Rice cultivation probably dates back to the antiquity and has probably been the first cultivated crop in Asia. For improving the productivity and profitability of Rice different high yielding varieties and hybrid varieties were released in different times which suppressed the cultivation of traditional rice varieties. Low yield, long duration of crop and raising cost of labour decreased the interest of farmers to cultivate traditional rice varieties. The outcome has been a monoculture of paddy cultivation of only a few varieties while thousands of varieties have disappeared from farmers land. Aromatic rice is rated best in quality and fetches much higher price in International market. These are now becoming more popular in Middle East, Europe and the United states (Das and Baqui, 2000). It is the rice with natural chemical compounds, which give it distinctive scent. It has aroma and taste due to presence of a volatile chemical compound which is 2-Acetyl-1-Pyrroline. . Aromatic rice is preferred and earned a very good price both in International and the local market. It has good demand for preparation of Biryani and Pulao. Aromatic rice possesses different important characters like, a) pleasant and exquisite aroma, b) soft texture, c) sweet taste and 5) delicate curvature and extra elongation with breadth wise swelling on cooking. Due to scarcity of water in rabi season a major number of farmers in red lateritic zone of west Bengal avoids winter cultivation. This factor is converted to an opportunity for long duration aromatic rice cultivation as it takes almost 150-160 days for harvesting which hampers winter cultivation.

Popular Aromatic Rice varieties of West Bengal and their character

Name	Land type	Grain colour	Kernel colour	Aroma	Maturity
Gobindhavog	Lowland	Gold furrows on straw	White	Present	Late
Radhunipagol	Lowland	Gold furrows on straw	White	Present	Late
Tulaipanji	Lowland	White	White	Present	Late
Tulsivog	Lowland	Black	White	Present	Late
Danarguri	Lowland	Straw	White	Present	Late
Nagrasal	Lowland	Straw	Light brown	Absent	Madium
Kalabhat	Lowland	Black	Black	Present	Late

Significance of Cultivation of indigenous aromatic rice:-

Economic Significance-

Economic significance of any crop indicates its market price as well as the input and output cost difference. From this view point, cultivation of that crop is economically significant which may provide maximum profit than others (Ahuja et al. 2008). The emerging aromatic rice innovations from developed countries such as the U.S. and other Asian countries which is generating a threat to these traditional aromatic rice producers such as India, Pakistan, and Thailand. To get economic profit from the cultivation of aromatic rice, emphasis should be given on Geographical Indication (GI) to protect the product (aromatic rice) and its traditional knowledge of cultivation of some geographical areas through WTO's Trade related aspects of Intellectual Property Rights (TRIPS) Agreement. In the paper, "A Yield potential study of short grain traditional aromatic varieties of red and lateritic region of West Bengal in comparison with short grain elite rice lines", Sinha et al.(2017) evaluated the yield potentiality of twenty one elite short grain aromatic cultivars along with three traditional aromatic cultivars in on farm condition during the kharif 2015 and 2016 and find out that some of traditional rice varieties are still have potentiality to give higher yield in comparison with the elite varieties.. According their study, traditional rice cultivars may be better choice for the marginal farmers for sustainable agriculture.

Ecological Significance

Ecological significance of cultivation of indigenous aromatic rice incorporates the relationship between the indigenous aromatic rice with other crops and also with their physical surroundings. In his work "Seeds of Tradition, Seeds of Future: Folk Rice Varieties from East India" Deb (2005) has discusses about the origin, biology and ecology of various indigenous rice varieties of Indian, basically in eastern India and shows the extinction of different folk crop genetic diversity due to modernization and industrialization.

Health benefits of traditional rice varieties

Nutritional facts about traditional rice

Traditional cultivars of Rice have nutritive value higher than hybrid rice varieties. This is having the vital function of acting as fuel for the body to carry on its vital activities. These traditional Rice varieties have lesser content of fat and good amount of oryzenol content as compared to hybrids and thus prevent the body from building up cholesterol levels. That ensures it as excellent source of food to be included as balanced diet in their routine dieting habits. These traditionally grown rice cultivars are good sources of minerals and vitamins such as niacin, thiamine, iron, riboflavin, vitamin D, calcium, and possess higher fiber and lesser amount of sugar content, making it an appealing choice for consumers suffering from diabetic complications. Rice does not contain gluten proteins (present in wheat), thereby making it an essential alternative for persons having requirements of gluten free diets such as patients suffering from celiac diseases. These varieties are non allergic due to absence of any additives, because these do not require excessive fertilizer and pesticide applications during their developmental and growth stages. . These cultivars ensure several

health benefits such as reducing the risk of developing type II diabetes, obesity and cardiovascular diseases by lowering the glycemic and insulin responses.

Present research and future scope

Currently, rice is regarded as a nutraceutical and functional food besides being a staple source of food and primary source of carbohydrate or starch. Its role of having low glycemic index in comparison to other genetically modified rice varieties, which containing complex carbohydrates and regarded as high glycemic index food provides a better novel substitute for diabetic patients. Presence of valuable mineral content, excellent starch characteristics. Antioxidant and anti inflammatory activity represent these unique among cereals sources (wheat, maize etc).starch of these rice is almost completely absorbed by human body. Scientifically, it have been proved, that Amino acids possessed by these varieties have high biological value, high content of essential fatty acids and selenium, and have anti-hypertension factor.

Technological gaps for indigenous rice production

- No such work yet has been done to understand and analyze the natural habitat or ecological niche of the indigenous rice varieties.
- The aromatic quality found best and production and productivity reaches maximum only in the area of their source of origin.
- In present times, experiments are focusing on higher yield through introducing genetically modified and purified paddy seeds and their conservation but eco-friendly cultivation means sustainable agriculture of these rice landraces in their origin area is rarely getting emphasis.
- Lack of marketing facility of these rice demoralised the farmers to continue the cultivation of indigenous rice.

Area expansion under indigenous rice cultivation

Although the production of aromatic rice per unit area is lower than the ordinary rice but the farmers are getting more price than ordinary rice and there is assured market of their produce in the state because the Government of West Bengal has created a great opportunity for the rice lovers, to find their favourite rice delivered right at their doorstep all over the world. only for this reason the farmers are showing interest regarding the cultivation of aromatic rice and the area under aromatic rice is increasing day by day. The uncertainty around production and prices of the common variety of paddy, Swarna, and the prospect of earning better income are driving farmers of West Bengal to go in for the cultivation of premium variety of aromatic rice. The increasing demand of the indigenous aromatic rice in domestic as well as international market influencing the farmers to go for its cultivation. The extension programme by government and distribution of seeds of indigenous rice and inputs through RastriyakrishiVikashYojana helps to increase the area significantly under indigenous rice.

Financial profitability of indigenous rice cultivation over HYV rice cultivation

Particular (Rs/acre)	High yielding variety of rice	Indigenous aromatic rice
Input cost (Rs/acre)	9300	6200
Human labour cost (Rs./acre)	8200	7100
Total cost of cultivation (Rs./acre)	17500	13300
Average yield (q/acre)	22	9.2
Price (Rs./q)	1850	4600
Gross Return (Rs/acre)	40700	42320
Net Return (Rs/acre)	23200	29020
B:C	1.32	2.18

Conclusion

Cultivation of Indigenous rice varieties with modern technique gives much more economical benefit over cultivation of high yielding rice varieties. Beside the economical benefit cultivation of Indigenous rice varieties helps to conserve traditional races of rice which helps to maintain ecological balance.

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