J Krishi Vigyan 2021, 9 (2) : 147-150 DOI : 10.5958/2349-4433.2021.00052.0

Maudamani Rice Cultivar Performed Better under Natural Farming Condition in Andaman and Nicobar Islands

Thanmai Paul[1], Meena B L[3], Bommyasamy N[1], Shailesh Kumar[4] , Kasinath B L[5] and D Basantia[2]

ICAR- Krishi Vigyan Kendra, North & Middle Andaman, Nimbudera
ICAR-Central Island Agricultural Research Institute, Port Blair

ABSTRACT

A field experiment was conducted to evaluate the Rice (*Oryza Sativa*) varieties suitable for natural farming syatem. The experiment was carried out in the *Kharif* season of 2019 and 2020 at ICAR-Krishi Vigyan Kendra, North & Middle Andaman, Nimbudera to study the yield attributes of different rice varieties. The experiment was laid out in a Randomized Block Design (RBD) and replicated fourth times. The treatments consisted of 05 five rice varieties *viz.,* Gayatri, Sarala, Hasanta, Maudamani, CSR 36. The variety Maudamani produced significantly higher grain yield of 8.6 t/ha and straw yield 9.6 t/ha and registered a enhanced yield increase ranging from 32 to 82 per cent over the other varieties. It was found that varieties and cultures differ widely among themselves when grown under similar natural farming system in terms of grain and straw yield. Hence, it was inferred that Maudamani rice variety proved better yield performing followed by Gayatri.

Key Words: Natural Farming, Maudamani, Yield Attributes, Rice, Varieties.

INTRODUCTION

The genotype of a crop has a decisive role towards utilization of these resources and finally production of economic yield (Hussain *et al,* 2014). Growth and yield characteristics of genotype depend on genetic and environmental factors. Alam *et al* (2008) reported that among production factors varietal selection at any location has an important role. Proper crop management depends on the growth characteristics of various varieties to get maximum benefit from new genetic materials.

In order to sustain agriculture production, enhance/maintain soil productivity and fertility; reduce/arrest soil degradation and environmental problems etc. the necessity of practicing natural or organic farming which is synonymous for biological agriculture is felt everywhere and thus research programme were initiated in agricultural system in late 1990s. Natural farming aims to increase farmer's yield by maximizing production factors (labor, soil, equipment) and by avoiding the use of non-natural inputs (fertilizer, herbicides and pesticides) to optimize production potential and thus provide abundant, high quality, healthy food at the best price. The golden rule is to enrich the level of organic matter into the soil, which supports microbial life, and therefore the soil's fertility (Tiwari and Saravanan Raj, 2020)

The objective of present study was to compare the growth and yield characteristics of different rice varieties under natural farming condition in valley area of Middle Andaman. As there is no

Corresponding Author's Email:tanugri1986@gmail.com
ICAR- Krishi Vigyan Kendra, Port Blair, South Andaman[1]
ICAR- Krishi Vigyan Kendra, North & Middle Andaman[2]
ICAR- Krishi Vigyan Kendra, Shikhopur, Gurugram[3]
ICAR- Krishi Vigyan Kendra, Malda, West Bengal[4]
ICAR- Krishi Vigyan Kendra, North Goa[5]

timely supply of Chemical/ Bio fertilizer, farmers are bound to practice rice cultivation in natural condition without applying of any external input in soil. The natural farming method for cultivating rice uses no external manure and fertilizers including organic manure and bio fertilizers etc. In Andaman and Nicobar Islands rice cultivation is practice in interspersed valleys in between undulated topography under natural condition since settlement. Area under rice cultivation is declining, because area under plantation crop like Arecanut & coconut is increasing every year. Further, the Andaman & Nicobar Administration is targeting to make Island as Organic Island in near future. Thus, findings of the experiment may be beneficial to the researchers and farmers to select particular varieties for higher yield target.

MATERIALS AND METHODS

The present study was conducted in the Krishi Vigyan Kendra Farm, North & Middle Andaman districts during *Kharif* season of 2018-19 and 2019-2020 (June to October). Top soil of experimental plot was silty clay in texture with soil pH 5.6-6 and rich in organic matter content (0.75%). The experiment was conducted in randomized complete block design (RCBD) with four replication. Five rice varieties Gayetri (145-160d), CSR 36 (125-135d), Hasanta (145d), Sarala (150 d), Maudamani (135d) in a plot size 5x7 m. Healthy seeds were soaked in water for 12 hr and then kept tightly in gunny bags. The seeds started sprouting after 24 hr and were sown after 48 hr. Seeds of selected cultivars were sown separately in well prepared 2m x 2m sizes wet bed for growing seedling. The selected plot was ploughed with power tiller and left for one week. After one week the land was ploughed and cross ploughed several times followed by laddering to obtain desirable tilth of soil for transplanting seedling. Twenty five days old seedlings were transplanted manually using 2 seedlings per hill at spacing 25x20 cm between line to line and plant to plant. After establishment of seedling various intercultural operations were accomplished for better growth and development of crop. Gap filling was done for all the plots at 10 d after transplanting. Water level was maintained at 5-10 cm up to late tillering stage of the crop. Weeding was done in all the plots at 20d after transplanting using Cono-weeder and again 45 days after transplanting to control weeds. The field was finally dried out 15d before harvesting. The rice was harvested manually from each plot depending on the maturity. The harvested crop of each plot was bundled separately, properly tagged and brought to threshing floor. The threshing and cleaning of rice seed were conducted with great care. Finally the weight of grains and straw was recorded on dry weight basis.

RESULTS AND DISCUSSION

Under natural farming system effective tillers per hill, No. of panicle per hill, panicle length, grain per panicles, 1000 grain weight, grain yield, straw yield were significantly influenced by rice varieties in similar climatic condition over a period of two years (Table.1). Maximum effective tillers per hill were recorded in rice variety Gayatri, which was significantly higher than Hasanta and CSR 36 and at par with Sarala & Maudamani. Number of panicle per hill was recorded highest in Hasanta, which is on par with other variety except CSR-36. Panicle length was recorded highest in Gayetri and Hasanta which was on par with other varieties. Statistically significant variation was recorded in terms of in panicle weight, the maximum panicle weight was recorded in Maudamani, which was significantly higher than Sarala, Hasanta, Gayatri and CSR36. Filled grain per panicles was also significantly varied from each other variety. Maudamani recorded highest filled grain per panicles, which is significantly higher than Sarala, Hasanta, Gayetri and CSR 36. 1000 grain weight was highest in Maudamani, which was significantly higher than Sarala, Hasanta, Gayetri and CSR 36 but Sarala and Hasanta found at par with each other. Significant Grain yield was recorded highest in Maudamani (8.6 t/ha), followed by Gayetri (5.3 t/ha), Sarala, Hasanta and CSR 36. Similarly, straw yield was

Table.1 Yield attributes, of coarse and fine grain rice varieties under natural farming system (mean data pooled over 2 years 2019-2020).

Variety	No. of tillers per hill	No. of Panicle per hill	Panicle length (cm)	Panicle weight (g)	Filled grain per panicles	1000 grain weight	Grain yield t/ ha	Straw yield t/ ha
Gayetri	17.66	14.66	25.66	07.66	236.00	30.00	5.3	7.0
Sarala	16.33	13.33	24.00	07.33	204.33	29.00	4.8	7.1
Hasanta	15.33	15.66	25.66	08.33	218.33	28.66	4.8	6.9
Maudamani	16.33	13.33	25.33	10.33	398.00	31.16	8.6	9.6
CSR 36	13.33	10.33	24.00	07.00	132.00	27.83	3.6	5.4
SEm±	0.58	2.24	0.83	0.42	6.38	0.39	0.12	0.12
CD (P=0.05)	1.35	5.17	1.91	0.97	14.72	0.90	0.29	0.29

recorded significantly highest in Maudamani, followed by Sarala, Gayatri, Hasanta and CSR 36. The similar results were commemorating with the findings of (Barikara Umesh *et al*, 2019; Singh, 2018; Anand *et al*, 2018; Masthana reddy *et al,* 2017; Kumar *et al,* 2016). Physiological growth is influenced by soil properties. Further, there is continuous accumulation of organic matter from nearby hilly forest land to interspersed valleys. Thereby soil is enriched with high organic carbon content. The advantages of growing rice in natural wet submerged soils include a general amelioration of chemical fertility, preferential accumulation of organic matter and improved availability of major, secondary and selected micronutrients. These soil fertility advantages benefits the better yield performance of rice for long-term in a sustainable way by maintenaing of soil fertility under natural farming systems. Similar results have been reported by Sahrawat (2008).

CONCLUSION

Overall, the performance of Maudamani in terms of grain and straw yield under natural farming system was highest (8.6 t/ha and 9.6 t/ha) followed by Gayatri (5.3 t/ha and 7.0 t/ha). The yield performances of CSR36 was lowest compared to other varieties in valley region of North and Middle Andaman climatic condition. Hence, farmers are advised for cultivation of better performing rice variety Maudamani in their field for higher yield under natural farming system.

ACKNOWLEDGEMENT

The authors are grateful to Dr. S Dam Roy, Former Director, ICAR-CIARI), Port Blair, Dr. A Kundu, Ex-Dierctor (i/c), and Dr. B A Jerard, Director (i/c), ICAR-CIARI, Port Blair for providing necessary support and guidance for completion of the work. Our sincere thanks to Principal Scientist (Rice Breeder) Dr. Sharat Pradhan, NRRI, Cuttack for providing us the Maudamani seed and Shri. Prasanta Pradhan (STA) for coordinating for procuring seed from NRRI Cutttack. We also thank NABARD, Port Blair, India and Indian Council of Agricutural Research (ICAR), New Delhi, India for funding.

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Received on 01/05/2021 *Accepted on 20/05/2021*