



Adoption of Recommended Rice Cultivation Practices by the Farmers

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ABSTRACT

In Maharashtra State, rice is the main crop grown in the coastal districts of the Konkan region mainly in the five districts namely Thane, Raigad, Ratnagiri, Sindhudurg and Palghar districts. The package of practices of rice cultivation is being recommended by DBSKKV, Dapoli since 1972. In Konkan region the area is about 0.44 million hectares with a production of about 15.10 lakh tons in the year 2013-2014. (Source: Directorate of Economics and Statistics, Department of Agriculture and cooperation, GOI 2013-2014). The area, production and productivity of rice crop in Palghar district was 14980 ha., 36641 qtls, 2446 kg / ha. Respectively, in the year 2014. The major food of the people in Konkan region is rice. It occupies an area of about 0.44 million hectares with annual production of nearly 15.10 lakh tones. The area under rice in Konkan is about 30.00 per cent of total area. However, productivity of Konkan region is 2.40 tons per hectare. Hence the present study was conducted in Wada and Palghar tahsils of Palghar district of Konkan region. The objective of this study was to ascertain the package of practices adopted by the rice growers from Palghar district of Maharashtra state. The sample was constituted 120 rice growers drawn from twelve villages. The respondents were interviewed with the help of a specially designed schedule. The ex-post facto research design was used for the present study. Majority of the respondent's medium adoption of the selected agricultural technologies of rice crop. The data regarding practice-wise adoption revealed that the respondents fully adopted high yielding variety 65.00 per cent, use of wooden plough for puddling 69.17 per cent, Place the seedling upright and shallow 80.84 per cent, Harvest the crop at 90% grain maturity and when plants are slightly green 100 per cent. Overall adoption is more than half 68.34 per cent of the respondent's medium adoption of the selected agricultural technologies of rice crop. The average adoption score was 66.49 indicating medium adoption.

Key words: Adoption, Recommended and Cultivation

Received 19.01.2019

Revised 09.02.2019

Accepted 13.02. 2019

INTRODUCTION

Rice is first mentioned in the Yajur Veda (c. 1500-800 BC) and then is frequently referred to in Sanskrit texts. In India there is a saying that grains of rice should be like two brothers, close but not stuck together. Rice is often directly associated with prosperity and fertility; hence there is the custom of throwing rice at newlyweds. In India, rice is always the first food offered to the babies when they start eating solids or to husband by his new bride, to ensure they will have children. The world rice cultivated on the area of 221.61 million hectares with production of 728.07 million metric tons in the year 2013-2014. Thus, rice production; consumption and trade are concentrated in Asia. More than 90 per cent of global production is occurring in tropical and semi-tropical Asia. One third of Asia's rice production is consumed in China and one-fifth in India. China and India are the major rice producing countries in the world, together contributing 55 per cent of the world rice production. (Source: www.usda.com) In India, rice is the promising crop to acquire self-sufficiency of food grain production for the population. Rice crop occupy the largest cultivated land in the country. It was cultivated on the area of 43.95 million hectares with production of 106.54 million tons in the year 2013-2014. In the year 2013-2014, the area under rice crop in India was maximum (5.98 million hectares) in Uttar Pradesh followed by West Bengal (5.50 million hectares). In terms of production of rice, West Bengal ranked first (15.31 million tons) followed by Uttar

Pradesh (14.63 million tons). In Maharashtra rice is grown on area of about 1.56 million hectares with a production of about 2.95 million tons. (www.irri.org)

In Maharashtra State, rice is the main crop grown in the costal districts of the *Konkan* region mainly in the five districts namely Thane, Raigad, Ratnagiri, Sindhudurg and Palghar districts. The package of practices of rice cultivation is being recommended by DBSKKV, Dapoli since 1972. In *Konkan* region the area is about 0.44 million hectares with a production of about 15.10 lakh tons in the year 2013-2014. (Source: Directorate of Economics and Statistics, Department of Agriculture and cooperation, GOI 2013-2014). The area, production and productivity of rice crop in Palghar district was 14980 ha., 36641 qtls, 2446 kg / ha. Respectively, in the year 2014. The major food of the people in *Konkan* region is rice. It occupies an area of about 0.44 million hectares with annual production of nearly 15.10 lakh tones. The area under rice in *Konkan* is about 30.00 per cent of total area. However, productivity of *Konkan* region is 2.40 tons per hectare.

MATERIAL AND METHODS

The present study was conducted during the year 2017-2018 by following Ex-post-Facto research design. This study was conducted in Ambajogai, Ashti and Gevarai talukas of Beed district as majority of area is under dryland farming practices.

Sampling procedure

Selections of taluka:

The study was purposively conducted in Ambajogai, Ashti and Gevarai tahasil of beed district on the basis of maximum dryland technology adopted by the farmers.

Selection of villages:

Four villages was selected purposively from each taluka, thus total 12 villages was selected for the present study.

Selection of respondents:

From selected village, list of dryland technology adopted farmers were prepare with the help of Agriculture Assistance and from that list 10 respondents were selected from each village to comprise total sample 120.

Tools and techniques of data collection

The data was collected with the help of specially designed interview schedule by keeping in view the objectives of study.

RESULT AND DISCUSSION

Packages of practices adopted by the rice growers

The result of the present investigation in respect of the adoption of recommended rice cultivation practices by the rice growers is presented in Table 1.

Table 1. Package of practices adopted by the rice growers

Sl. No	Particulars	Adoption (N = 120)		
		Full	Partial	No
1	Use of high yielding variety	78 (65.00)	25 (20.83)	17 (14.16)
2	Preparatory tillage			
2.1	Add FYM or Compost @ 7.5 t/ha to the soil at the time of second ploughing	15 (12.50)	50 (41.66)	55 (45.84)
2.2	Add Glyricidia leaves @ 5 t/ha to the nursery to avoid application of nitrogenous fertilizers.	0 (00.00)	15 (12.5)	105 (87.5)
3	Nursery management			
3.1	Use quality of seed of improved variety.	34 (28.34)	47 (39.17)	39 (32.5)
3.2	Prepare raised beds for sowing of seed.	18 (15.00)	21 (17.50)	81 (67.50)
3.3	Add 1 kg Urea + 3 kg Single Super Phosphate per guntha area of raised bed	0 (00.00)	69 (57.5)	51 (42.5)
3.4	Treat seed with Thirum at the rate 2.5 gm/1 kg of seed before sowing the seed.	0 (00.00)	13 (10.84)	107 (89.16)
3.5	Apply second dose of Urea @1 kg/ha, 50 days after sowing.	0 (00.00)	47 (39.17)	73 (60.83)
3.6	For small seeded varieties recommended seed rate is 35-40 kg/ha	37	41	42

		(30.84)	(34.16)	(35.00)
3.7	For bold seeded varieties recommended seed rate is 50-60 kg /ha	33 (27.50)	57 (47.50)	30 (25.00)
3.8	Spray Oxadiargyl (6 E.C.) herbicide @ 3 ml per liter of water for 0.01 ha.	31 (25.83)	0 (00.00)	89 (74.17)
4	Transplanting			
4.1	Transplant seedling within 15-25 days depending on duration of variety.	37 (30.84)	56 (46.66)	27 (22.50)
	Use implements for puddling			
4.2	a) Wooden plough	83 (69.17)	27 (22.50)	10 (8.33)
4.3	Pankaj puddler	0 (00.00)	0 (00.00)	120 (100.00)
4.4	c) Power tiller	13 (10.84)	14 (11.67)	93 (77.50)
4.5	Maintain recommended plant population during transplanting. Plant only 2 to 3 seedlings per hill	58 (48.34)	37 (30.83)	25 (20.83)
4.6	Place the seedling upright and shallow.	97 (80.84)	23 (19.16)	0 (00.00)
5	Use of chemical fertilizers			
5.1	Apply 40 kg N, 50 kg P and 50 K/ha as a basal dose during transplanting.	22 (18.33)	30 (25.00)	68 (56.66)
5.2	Apply second dose at the rate 40 kg N /ha at the tillering stage.	22 (18.34)	30 (25.00)	68 (56.66)
5.3	Apply third dose of 20kg N for ha. at flowering stage.	22 (18.33)	30 (25.00)	68 (56.67)
	(Char - Sutri)			
5.1	Mix half to one kg of paddy husk ash per square meter of nursery and add 20 kg of paddy straw per guntha to soil with the help of plough.	0 (00.00)	5 (4.16)	115 (95.84)
5.2	Place UBDAP briquette at 7 to 10 cm depth in each square of seedling on same day of transplanting.	0 (00.00)	5 (4.16)	115 (95.84)
5.3	Add 10 t/ha of Glyricidia leaves during puddling to avoid application of nitrogenous fertilizers.	0 (00.00)	5 (4.16)	105 (95.84)
6	Water management			
6.1	Maintain water depth of 2-5 cm for period of 1 month after transplanting	97 (80.84)	0 (00.00)	23 (19.16)
6.2	Maintain water depth of 10 cm.,10 days before and after panicle emergence.	97 (80.84)	0 (00.00)	23 (19.16)
6.3	Maintain water level of 5 cm. upto grain filling stage.	115 (95.84)	0 (00.00)	5 (4.16)
6.4	Drain out water 8 to 10 days prior to harvesting.	110 (100.0)	0 (00.00)	0 (00.00)
7	Weed management			
7.1	Weed the field as per the need and keep field clean.	87 (72.50)	0 (00.00)	15 (12.50)
7.2	Use Japanese hoe 30-35 days after transplanting to control weed population.	0 (00.00)	15 (12.50)	105 (87.50)
7.3	Use of Cono weeder 30-35 days after transplanting to control weed population	0 (00.00)	15 (15.50)	105 (87.50)
7.4	In case of weedicide application, apply Butachlor 50% at the rate 1.5 kg /ha in 600 liters of water.	5 (4.16)	5 (4.17)	110 (91.67)
8	Plant protection			
A	CLP - Deep ploughing after Kharif crop.	32 (26.67)	0 (00.00)	88 (73.33)
B	MP- Collection of plant residues immediately after harvesting.	17 (14.16)	41 (34.17)	62 (51.67)
C	CLP- Transplanting seedlings of proper age to reduce the incidence of pest.	37 (30.84)	56 (46.66)	27 (22.50)
A	Stem borer			
8.1	CLP- Collect and destruct stubbles in field.	11 (9.16)	87 (72.50)	22 (18.34)
8.2	MP- Harvest crop close to the ground using Vaibhav sickle.	26	33	61

		(21.66)	(27.50)	(50.84)
8.3	MP- Removal and destruction of infested plant parts.	36 (30.00)	31 (25.84)	53 (44.16)
8.4	CP- a) Apply Carbofuran (3 %) 25 kg/ha or	0 (00.00)	23 (19.16)	97 (80.84)
	b) Apply Phorate (10%) 10 kg/ha or	0 (00.00)	17 (14.17)	103 (84.83)
	c) Apply Quinolphos (5 %) 5kg/ha.	0 (00.00)	5 (4.16)	115 (95.84)
B	Army worm			
8.1	CLP- Collect and destroy eggs and larvae.	8 (6.68)	44 (36.68)	58 (48.4)
8.2	CP- Dust 2 % Methyl Parathion powder @ 20 kg /ha.	0 (00.00)	10 (83.34)	110 (91.66)
8.3	BP- Maintain frog population in field.	20 (16.66)	33 (27.50)	67 (55.84)
C	Leaf roller			
8.1	CLP- Collect and destroy eggs and larvae.	0 (00.00)	30 (25.00)	90 (75.00)
8.2	CP- a) Spray Monocrotophos 36 E.C, 700 ml per 500 liters of water per ha, or	7 (5.84)	23 (19.16)	90 (75.00)
	b) Spray Fenitrothion 50 E.C, 500 ml per 500 liter water per ha or	8 (6.66)	23 (19.17)	89 (74.17)
	c) Spray Carbaryl 50 F.C., 1kg per 500 liters of water per ha.	8 (6.66)	23 (19.17)	89 (74.17)
D	Gundi bug			
8.1	CLP- Remove and destroy infested plant parts.	36 (30.00)	31 (25.84)	53 (44.16)
8.2	CP- a) Add 10 days after transplanting 0.3 % Propanil @ 25 kg./ha or	0 (00.00)	15 (12.50)	105 (87.50)
	b) Add 10 days after transplanting 10 % Phorate @ 10 kg./ha or	0 (00.00)	30 (25.00)	90 (75.00)
	c) Add 5 % Quinalphos @ 15 kg/ha or	0 (00.00)	5 (4.16)	115 (95.84)
	d) Add 10 % Chloropyriphos @10 kg/ha to the soil.	0 (00.00)	10 (8.34)	110 (91.66)
E	Blue Beetle			
8.1	CLP- Keep bunds clean	0 (00.00)	100 (83.33)	20 (16.67)
8.2	CLP- Avoid water stagnation in the field	43 (35.84)	57 (47.50)	20 (16.66)
8.3	CP- a) Spray 25% Quinolphos @ 2000ml/ 500 liters of water/ha. or	0 (00.00)	13 (10.83)	107 (89.16)
	b) Spray 40% Triazophos @ 625 ml./500 liters of water/ha.	0 (00.00)	0 (00.00)	0 (00.00)
	c) Spray 5% Lambdacyhalothrin @ 250 ml./500 liters of water/ha.	0 (00.00)	0 (00.00)	0 (00.00)
F	Crabs			
8.1	CP- Go for poison baits for control of crabs	0 (00.00)	8 (6.67)	112 (93.33)
8.2	CP- a) Prepare poison baits by mixing Acephate (75% WP) 75 gm. with 1 kg. cooked rice and place in active holes	0 (00.00)	8 (6.66)	112 (93.34)
8.3	b) Prepare poison baits by mixing 100 ml Methyl Parathion (50%) in 1 kg cooked rice and place in active holes or	0 (00.00)	6 (5.00)	114 (95.00)
8.4	BP- Maintain frog population in field.	20 (16.66)	33 (27.50)	67 (55.84)
9	Diseases			
A	Seed Treatment			
	CLP - Remove stubbles and burn			
9.1	CP- a) Treat seed with Thirum @ 3 gm/kg of seed	4 (3.34)	10 (8.33)	106 (88.33)
9.2	b) Treat seed with 3% brine water solution	7	20	93

		(5.84)	(16.66)	(75.50)
B	Blast			
9.1	Spray the crop with Edifenphos @ 1ml/liter of water or	4 (3.34)	13 (10.84)	103 (85.82)
9.2	Spray the crop with Carbendazim @ 1gm/liter of water	16 (13.33)	0 (00.00)	104 (86.66)
9.3	CLP- Use resistant varieties			
	Karjat-1	17 (14.66)	29 (24.17)	74 (61.67)
	Karjat-3	13 (10.84)	16 (13.33)	91 (75.83)
C	Bacterial leaf blight			
9.1	CLP-Remove and destroy stubbles in the field.	11 (9.16)	87 (72.50)	22 (18.34)
9.2	MP- Keep the bunds clean	107 (89.16)	13 (10.84)	0 (00.00)
9.3	CP- Mix Streptocycline (100 ppm) 1 gm in Copper oxychloride solution (25 gm in 10 litre of water) and spray the crop	0 (00.00)	25 (20.84)	95 (79.16)
9.4	CLP-Use resistant variety			
	Karjat -1,	17 (14.16)	29 (24.17)	74 (61.67)
	Karjat-3,	45 (37.50)	18 (15.00)	57 (47.50)
	Ratnagiri-2	0 (00.00)	23 (19.17)	97 (80.83)
	Ratnagiri-711,	15 (12.50)	0 (00.00)	105 (87.50)
	Jaya,	0 (00.00)	25 (20.84)	95 (79.16)
	Palghar-1	19	12	89.00
C	False smut			
9.1	CLP- As a preventive measure spray a) 2.5gm Mancozeb (Dithane M-45)/liter of water	6 (5.00)	7 (8.84)	107 (89.16)
	b) 3gm Zineb (Dithane Z-78)/liter of water	6 (5.00)	7 (8.84)	107 (89.16)
10	Harvesting			
10.1	Harvest the crop at 90% grain maturity and when plants are slightly green.	120 (100.0)	0 (00.00)	0 (00.00)
10.2	Cut the crop close to the ground with the help of Vaibhav sickle.	26 (21.66)	33 (27.50)	61 (50.84)
10.3	Allow the crop to dry under sun for 2 days after harvest.	112 (93.34)	8 (6.66)	0 (00.00)
11	Threshing			
	a) Mechanical thresher	53 (44.16)	0 (00.00)	67 (55.84)
	b) Hand operated thresher	07 (5.83)	36 (30.00)	77 (64.17)
	c) Beating against stone.	65 (54.16)	26 (21.67)	29 (24.17)
12	Winnowing			
12.1	By Hand	108 (90.00)	0	12 (10.00)
12.2	By Machine	23 (19.16)	0 (00.00)	97 (80.84)
13	Storage			
13.1	Allow the grains to dry under sun for 3-4 days before storage	120 (100.0)	0 (00.00)	0 (00.00)
13.2	Add dry neem leaves in storage bin	87 (72.50)	0 (00.00)	33 (27.50)

The data regarding practice-wise adoption revealed from Table 1 that, 65.00 per cent of the respondents 'not' adopted high yielding variety. The majority (87.50 per cent) of the respondents 'not' adopted practice

of 'Add Glyricidia leaves @ 5 t/ha to the nursery to avoid application of nitrogenous fertilizers. The 57.50 per cent of the respondents 'partially' adopted the practice 'application of 1 kg Urea and 3 kg SSP/R in bed. It was also observed that majority of the farmers 'fully' adopted the practice namely 'use of wooden plough (69.17 per cent) or power tiller for puddling' (10.84 per cent). It is revealed that most of the farmers 'partially' adopted practices 'Use fertilizer dose of 100 kg N, 50 kg P and 50 kg K/ ha' (25.00 per cent), 'Apply 40 kg N, 50 kg P and 50 K/ha as a basal dose during transplanting', 'Application of second dose of 40kg N /ha at the time of tiller's formation' (25.00 per cent), 'Application of third dose of 20kg N at the time of flowering' (25.00 per cent). The all (100.00) per cent of the farmers 'fully' adopted the practice 'Drain out water 8 to 10 days prior to harvesting'. It is revealed that most of the farmers 'fully' adopted practices 'Hand weeding' (72.50 per cent). Majority (72.52 per cent) 'partially' adopted the practice removal and destructions of stubbles. Majority of them (95.84 per cent) 'not' adopted the practice, apply Quinolphos (5.00%) 5kg/ha. for control stem borer. The majority (91.66 per cent) of the respondents 'not' adopted practice of 'Dust 2 % Methyl Parathion powder @ 20 kg /ha, 75.00 per cent of the respondents 'not' adopted the practice of application of insecticide like monochrotophos 36 E.C use at the rate 700ml, per 500 liters of water per ha, respectively for controlling leaf roller, 87.50 per cent of the respondents 'not' adopted the practices 'Add after 10 days of transplanting 0.3 per cent propanil.25 kg in the soil' for controlling the Gundi bug and 83.33 per cent of the respondents 'partially' adopted the practices 'Keep bunds clean' for control of blue beetle. The majority (93.34 per cent) of the respondents 'not' adopted to control crab were 'Go for poison baits for control of crabs, 75.83 per cent of the respondents 'not' adopted the practice of use of disease resistance varieties for blast disease. and majority 89.16 per cent of the respondents 'fully' adopted of practice was keep the bunds clean for control of bacterial leaf blight disease of rice and 89.16 per cent of the respondents 'not' adopted the practice of, application of preventive measure, spray that is, 2.5gm Mancozeb (Dithane M-45) or 3 gm. Zineb (Dithane Z-78)/ liter of water. It is observed that 100.00 per cent of the respondents 'fully' adopted the practice 'Harvest the crop at 90% grain maturity and when plants are slightly green. The majority (54.16 per cent) fully adopted practices of 'Allow the crop to dry under sun for 2 days after harvest'. The majority (90.00 per cent) of the respondents 'fully' adopted practices of winnowing by hand. The 100 per cent of the respondents 'fully' adopted of practices of 'Allow the crop to dry under sun for 2 days after harvest', while 72.50 per cent of the respondents 'fully' adopted the practice 'Add dry neem leaves in storage bin.

Overall adoption of the recommended rice cultivation practices

The result of the present investigation in respect of the overall adoption of the recommended rice cultivation practices by the rice growers are presented in Table 2

Table.2 Distribution of respondents according to their Overall Adoption

Sl. No.	Category	Respondents (N=120)	
		Frequency	Percentage
1.	Low (up to 53)	15	12.50
2.	Medium (54 to 79)	82	68.34
3.	High (80 and above)	23	19.16
Total		120	100

It is noticed from table 2 that 68.34 per cent of the respondents 'medium' adoption of the selected agricultural technologies of rice crop, while 19.16 per cent and 12.50 per cent of the respondents 'high' and 'low' adoption, respectively. The average adoption score was 66.49. It can be concluded from these findings that rice growers medium level of adoption of the selected agricultural technologies of rice crop. In other words, it can be said that there is scope to increase the adoption by way of educating and motivating the farmers along with arrangements for supply of required inputs. The findings are similar with the findings of Tambat [3] and Wadekar [2].

CONCLUSION

It was concluded that the extent of adoption of recommended rice cultivation technology by the farmers was at medium level. The study has clearly indicated the practices which were fully and partially adopted as well as not adopted by the farmers. These observations may serve as feedback for future line of action. Demonstration and training on rice technology need to be taken massively by concerned extension and development agencies in these areas for the practices which were least or non-adopted.

ACKNOWLEDGEMENT

The authors are thankful Department of Department of Extension Education, College of Agriculture, Dapoli. (M.S.) DBSKKV, Dapoli for providing all facilities required during experimental work.

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CITATION OF THIS ARTICLE

Karangami R. S., Holkar S. C., Wanole S. N. and Mehta P. G., Adoption of Recommended Rice Cultivation Practices by the Farmers *Bull. Env. Pharmacol. Life Sci.*, Vol 8 [6] May 2019: 124-130