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Knowledge about recommended rice cultivation practices by farmers from Palghar district

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Abstract
The present study was conducted in Palghar district of Konkan region of Maharashtra state. Two tahsils namely Wada and Palghar selected purposively for this study on the basis of maximum area under cultivation of rice crop. From each selected tehsil, six villages were selected on the basis of higher production of rice. Total twelve villages were selected randomly. From each selected village 10 rice growers were selected from each village making a total sample of 120 farmers. The data were collected through personal interview method. The majority of the respondents 60.00 per cent of the respondents were knowing about 'Use of high yielding varieties. The majority 87.85 per cent of the respondents were knowing about 'Use quality of seed of improved variety'. The 48.34 per cent of the respondents were knowing about 'Prepare of raised bed for sowing of seed'. The 63.34 per cent of the respondents were knowing about 'Harvest crop close to the ground using Vaibhav sickle'. The overall result show that maximum number (75.00 per cent) of the respondents had 'medium' knowledge of the rice. While each 12.50 per cent of the respondents had 'low' and 'high' level of the knowledge respectively. Average knowledge score of the farmer was 55.02.

Keywords: Knowledge, Rice cultivation, Farmers

Introduction
Rice (*Oryza sativa* L.) is one of the most important cereal grains in the world today and serves as a staple food source for more than half of the world's population (Source.www.thecropsite.com), particularly in India, China and a number of other countries in Africa and Asia. India is facing the challenges of food and fodder production to meet the demand of rising human and cattle population. The world rice cultivated on the area of 221.61 million hectares with production of 728.07million 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. 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

Present study was carried out in Palghar district of Konkan region of Maharashtra state. Two tahsils namely, Wada and Palghar selected purposively for this study on the basis of maximum area under cultivation of rice crop. From each selected tahsil six villages were randomly selected, applying the criterion of maximum rice area. Thus, total twelve villages were selected. From each selected village ten respondents were selected randomly. Thus, total 120 respondents were randomly selected for this study. Ex- post facto study design was used. The obtained final scores were categorized into three groups namely, 'Low', 'Medium' and 'High', considering the mean and standard deviation.

Result and Discussion

Knowledge about recommended rice cultivation by farmers

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

Table 1: Knowledge about recommended rice cultivation by farmers

Sl. No	Particulars	Knowledge (N = 120)	
		Frequency	Percentage
1	**Use of high yielding variety**	78	65.00
2	**Preparatory tillage**		
2.3	Add FYM or Compost @ 7.5 t/ha to the soil at the time of second ploughing	120	100.00
2.4	Add Glyricidia leaves @ 5 t/ha to the nursery to avoid application of nitrogenous fertilizers.	37	30.84
3	**Nursery management**		
3.1	Use quality of seed of improved variety.	105	87.50
3.2	Prepare of raised beds for sowing of seed.	58	48.34
3.3	Add 1 kg urea + 3 kg single super phosphate per R area of the raised bed	84	70.00
3.5	Treat the seed with thirum @ 2.5 gm/1 kg before sowing the seed.	38	31.67
3.6	Apply second dose of urea/1 kg urea 50 days after sowing seed.	56	46.67
3.7	For small seeded varieties recommended seed rate is 35-40 kg/ha	85	70.84
3.8	For bold seeded varieties recommended seed rate is 50-60 kg /ha	85	70.84
3.10	Spray Oxadiagyl (6 E.C.) herbicide @ of 3 ml per liter of water for 0.01 ha.	31	25.83
4	**Transplanting**		
4.1	Transplant seedling within 15-25 days depending on duration of variety.	120	100.00
	Use implements for puddling		
4.2	1) wooden plough	120	100.00
4.3	2) Pankaj puddler	10	8.34
4.4	3) Power tiller	48	40.00
4.5	Maintain recommended plant population during transplanting. Plant only 2 to 3 seedling per hill	120	100.00
4.6	Place the seedling upright and shallow.	120	100.00
5	**Use of chemical fertilizers**		
5.1	Apply 40 kg N, 50 kg P and 50 K/ha as a basal dose during transplanting.	76	65.00
5.2	Apply second dose at the rate 40kg N /ha at the tillering stage.	76	65.00
5.3	Apply third dose of 20kg N for ha. at the time of flowering.	76	65.00
	(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 with the help of plough.	18	15.00
5.2	Place UBDAP briquette at 7 to 10 cm depth in each square of seedling within same of transplanting.	15	12.50
5.3	Add 10 t/ha of Glyricidia leaves during puddling to avoid application of nitrogenous fertilizer.	15	12.50
6	**Water management**		
6.1	Maintain ware depth of 2-5 cm for period of 1 month after transplanting	120	100.00
6.2	Maintain water depth of 10 cm. 10 days before and after panicle emergence.	120	100.00
6.3	Maintain water level of 5 cm. upto grain filling stage.	120	100.00
6.4	Drain out water 8 to 10 days before prior to harvesting.	120	100.00
7	**Weed management**		
7.1	Weed the field as per the need and keep field clean.	120	100.00
7.2	Use of Japanese hoe 30-35 days after transplanting control weed population.	32	26.66
7.3	Use of cono weeder 30-35 days after transplanting control weed population	32	26.66
7.4	In case of weedicide application, apply butachlor 50% at the rate 1.5 kg /ha in 600 liter of water.	25	20.84
8	**Plant protection**		
A	CLP -Deep ploughing after Kharif crop.	120	100.00
B	MP-Collection of plant residues immediately after harvesting.	120	100.00
7.7	CLP- Transplanting of seedling at proper age reduces the incidence of pest.	120	100.00
A	**Stem borer**		
8.1	CLP- Collect and destruct stubbles in field.	120	100.00
8.2	MP- Harvest crop close to the ground using Vaibhav sickle.	76	63.34
8.3	MP-Removal and destruction of infested plant parts.	120	100.00
8.4	CP- a) Apply Carbofuran (3 %) 25 kg/ha or	32	26.67
	b) Apply Phorate (10%) 10 kg/ha or	40	33.34
	c) Apply Quinolphos (5 %) 5kg/ha.	35	29.17
B	**Army worm**		
8.1	CLP- Collect and destroy eggs and larvae.	120	100.00
8.2	CP- Dust 2 % Methyl Parathion powder @ 20 kg /ha.	38	29.68

	BP- Maintain frog population in field.	87	72.50
C	**Leaf roller**		
8.1	CLP- Collect and destroy eggs and larvae.	120	100.00
8.2	CP- a) Spray Monocrotophos 36 E.C, 700 ml per 500 liters of water per ha, or	42	35.00
	b) Spray Fenitrothion 50 E.C, 500 ml per 500 liter water per ha or	42	35.00
	c) Spray Carbaryl 50 F.C., 1kg per 500 liters of water per ha.	48	40.00
D	**Gundi bug**		
8.1	CLP- Remove and destroy infested plant parts.	120	100.00
8.2	CP- a) Add 10 days after transplanting 0.3 % Propanil 25 kg./ha or	32	26.67
8.3	b) Add 10 days after transplanting 10 % Phorate @ 10 kg./ha or	40	33.33
	c) Add 5 % Quinalphos 15 kg/ha or	35	29.17
	d) Add 10 % Chloropyriphos, 10 kg/ha in the soil.	29	24.17
E	**Blue Beetle**		
8.1	CLP- Keep bunds clean	120	100.00
8.2	CLP- Avoid water stagnation in the field	120	100.00
8.4	CP- a) Use 25% Quinolphos 2000ml per 500 liters of water per ha. Or	35	29.17
	b) 40% Triazophos 625 ml. per 500 liters of water per ha. or	15	12.30
	c) 5% Lambdacychalothrin 250 ml. per 500 liters of water per ha.	0	0
F	**Crabs**		
8.1	CP- Go for poison baits for control of crabs	34	28.34
8.2	CP-Prepare poisons bait by the mix of 1 kg. Cooked rice 75 gm. 75% water soluble acephate powder mix in water.	34	28.34
8.3	CP-Mixing 100 ml 50% methyl parathion in 1 kg cooked rice or	8	6.66
8.4	CP-Preparation of 100 gm. Tablet of 50% water soluble carbaryl powder and keeping in the each hole and covering it with soil.	8	6.66
8.5	BP- Maintain frog population in field.	87	72.50
9	**Diseases**		
A	**Blast**		
	Seed Treatment		
	CLP - Remove stubbles and burn	120	100.00
9.1	CP- Seed treatment application of 3gm thirum/ kg seed. OR	42	35.00
9.2	CP-Use of 3% brine water solution for seed treatment	46	38.34
9.3	CP-Spraying of 1ml Edifenphos per liter of water or	15	12.50
	1gm Carbendazim per liter of water.	26	21.67
	CLP-Use following resistant varieties		
	a) Karjat-1	54	45.00
	b) Karjat-3	86	71.67
B	**Bacterial leaf blight**		
9.1	CLP-Removal and destruction of stubbles.	120	100.00
9.2	MP- Keep the bunds clean	120	100.00
9.3	CP-For control of bacterial blight use copper oxycloride 25 gm + 1 gm strepthocycline mixing with 10 litre of water.	45	37.50
9.4	CLP-Use following resistant variety		
	a) Karjat -1	63	52.50
	b) Karjat-3	76	63.34
	c) Ratnagiri-711	32	26.66
	d) Ratnagiri-2	32	26.66
	e) Jaya,	36	30.00
	f) Palghar-1	47	39.16
C	**False smut**		
9.1	**CLP-**As a preventive measures spraying A) 2.5gm Mancozeb (Dithane M-45) per liter of water or	34	28.34
	B) 3gm Zineb (Dithane Z-78) per liter of water	37	30.84
10	**Harvesting**		
10.1	Harvest the crop at 90%grain maturation and plants are still green.	120	100.00
10.2	Cut the crop at ground level with the help of *Vaibhav* sickle.	76	63.33
10.3	Dry under sun for 2 days after harvest in the field.	120	100.00
11	**Threshing**		
	a) Mechanical threshar	100	83.34
	b) Hand operated threshar	19	15.84
	c) Beating against stone.	120	100.00
12	**Winnowing**		
11.1	By Hand	120	100.00
11.2	By Machine	120	100.00
12	**Storage**		
12.1	Before storage, grains for 3-4 days dry under sun.	120	100.00
12.2	Add dry neem leaves in storage bin	120	100.00

It is seen from the Table 1 that the majority of the respondents 60.00 per cent of the respondents were knowing about 'Use of high yielding varieties. The all 100 per cent of the respondents were knowing about 'Add 7.5 t/ha FYM or

Compost to the soil at the time of second ploughing', One half of the (30.84per cent) were knowing about 'During puddling add Glyricidia leaves @ 5 t/ha to avoid application of nitrogen through chemical fertilizers'. The majority 87.85 per cent of the respondents were knowing about 'Use quality of seed of improved variety'. The 48.34 per cent of the respondents were knowing about 'Prepare of raised bed for sowing of seed'. The majority 70.00 per cent of the respondents were knowing about 'Add 1 kg urea + 3 kg single super phosphate per R area of the raised bed' and one half 31.67 per cent of the respondents were knowing about 'Treat the seed with thirum at the rate 2.5 gm/1 kg before sowing the seed' while 46.67 per cent of the respondents were knowing about 'Apply second dose of urea/1 kg urea 50 days after sowing seed'. The majority 70.84 per cent of the respondents were knowing about 'for small seeded varieties recommended seed rate is 35-40 kg/ha' and 'for bold seeded varieties recommended seed rate is 50-60 kg /ha'. The 25.83 per cent of the respondents were knowing about 'Spray Oxadiagyl (6 E.C.) herbicide at the rate of 3 ml per liter of water for 0.01 ha'. All respondents were knowing about 'Transplant seedling within 15-25 days depending on duration of variety' while 40.00 percent of the respondents were knowing about 'Power tiller'. All respondents were knowing about 'Maintain recommended plant population during transplanting. Plant only 2 to 3 seedling per hill' and Place the seedling upright and shallow. The majority of the respondents 76.00 per cent were knowing about 'Apply 40 kg N, 50 kg P and 50 K/ha as a basal dose during transplanting', 15 per cent of the respondents were knowing about (Char – Sutri). The all the respondents were knowing about 'Maintain ware depth of 2-5 cm for period of 1 month after transplanting' and Maintain water depth of 10 cm.10 days before and after panicle emergence, Maintain water level of 5 cm. upto grain filling stage, Drain out water 8 to 10 days before prior to harvesting. All the respondents were knowing about 'As per the need fallow hand weeding on the field', while 26.66 per cent of the respondents were knowing about 'Use of cono weeder 30-35 days after transplanting. The all the respondents were knowing about 'control weed population' and Collect and destruct stubbles in field for control stem borer. The 63.34 per cent of the respondents were knowing about 'Harvest crop close to the ground using Vaibhav sickle' and 33.34 per cent of the farmers were knowing the practice of 'Apply Phorate (10.00 %) 10 kg/ha'. It was observed that all the respondents had knowledge about the practice 'Collect and destroy eggs and larvae', followed by 29.68 per cent of the respondents were knowing about 'Dust 2 % Methyl Parathion powder @ 20 kg /ha.' for control army worm and 40.00 percent of the respondents were knowing about 'The Spray Carbaryl 50 F.C., 1kg per 500 liters of water per ha.' for control leaf roller. All the respondents were knowing about 'Remove and destroy infested plant parts.', while 26.67 per cent of the respondents were knowing about 'Add 10 days after transplanting 0.3 % Propanil 25 kg./ha' for control Gundi bug. All the respondents were knowing about 'Avoid water stagnation in the field' while 29.17 per cent of the respondents were knowing about 'Use 25% Quinolphos 2000ml per 500 liters of water per ha'. The 34.00 per cent of the respondents were knowing about 'Go for poison baits for control of crabs'. All the respondents were knowledge about 'Remove stubbles and burn', while 35.00 per cent of the respondents were knowledge about 'Seed treatment application of 3gm thirum/ kg seed' for control Blast. And the 37.50 per cent of the respondents were knowing about 'For control of bacterial blight use copper oxycloride 25 gm + 1 gm strepthocycline mixing with 10 liter of water.' For control bacterial leaf blight. The 28.34 per cent of the respondents were knowledge about 'As a preventive measures spraying 2.5gm Mancozeb (Dithane M-45) per liter of water' for control false smut of rice. It observed that all the respondents were knowing 'Harvest the crop at 90%grain maturation and plants are still green.', and Dry under sun for 2 days after harvest in the field while 63.33 per cent of the respondents were knowing 'Cut the crop at ground level with the help of *Vaibhav* sickle'. The majority 83.34 per cent of the respondents were knowing about mechanical thresher for threshing and all respondents were knowing about Beating against stone for threshing of rice. All the respondents were knowing about winnowing with the help of hand and machine. All the respondents were knowledge about 'Before storage, grains for 3-4 days dry under sun.' and Add dry neem leaves in storage bin**.** Conclusion can be drawn from these findings that majority of the rice growers had medium knowledge.

Overall knowledge about the recommended rice cultivation practices

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

Table 2: Distribution of respondents according to their Overall Knowledge

Sl. No.	Category	Respondents (N=120)	
		Frequency	Percentage
1.	Low (up to 49)	15	12.50
2.	Medium (50 to 60)	90	75.00
3.	High (61 and above)	15	12.50
Total		120	100.00
Average=55.02		S.D.=5.93	

It is seen from Table 2 that maximum number (75.00 per cent) of the respondents had 'medium' knowledge of the rice. While each 12.50 per cent of the respondents had 'low' and 'high' level of the knowledge respectively. Average knowledge score of the farmer was 55.02.

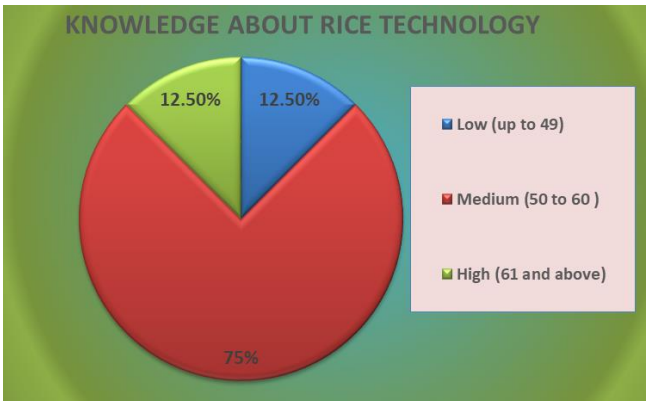

Fig 1: Distribution of respondents according to their Overall Knowledge

Conclusion

It was conclude that knowledge about the recommended rice cultivation technology by the farmers was at medium level. The study has clearly indicated the knowledge of recommended rice cultivation practices of by the farmers was medium level. They lacked conceptual clarity on some of the

practices such as lack of knowledge for making appropriate concentration of insecticide / fungicide for use, lack of knowledge about high yielding rice varieties. Hence the Researchers, NGOs and Department of Agriculture who are popularising this technology, should develop complete knowledge among farmers on all recommended rice cultivation practices, which can be done through training programs and field demonstrations with the involvement of farmers and labour and by conducting study tours, frequent visits of extension staff and by publicity through mass media. The investigation has confirmed that the extent of recommended rice technology was depend on their characteristics namely knowledge level. The extension workers may make this factor for promoting the knowledge and theory of improved rice cultivation technology amongst the farmers.

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