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RESEARCH ARTICLE :

Knowledge levels and adoption pattern of rice production technology among the Navsari district farmers

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SUMMARY : Knowledge of farmers plays an important role in adoption of scientific package of practices. The present study was conducted in Navsari district of South Gujarat during year 2011 to 2013 to study the overall knowledge levels and adoption pattern of rice production technology. Total 200 respondents were selected. The results of overall knowledge of scientific cultivation practices of paddy indicated that farmers having low, medium and high level before contact with KVK was 73 per cent, 20 per cent and 7 per cent, respectively but it was altered up to 19 per cent, 67 per cent and 14 per cent, respectively after contact with the KVK. The study indicated that the about 67.00 per cent of the rice growers had medium level of knowledge, whereas, only 7 per cent of the rice growers had high level of knowledge about scientific cultivation practice of rice. The per cent increase yield of 25.9, 23.03 and 3.0 per cent during the year 2011-12, 32.22, 19.36 and 13.3 per cent during the year 2012-13 and 30.9, 22.1 and 14.5 per cent during the year 2013-14 were found under the paddy variety NAUR-1, GNR-3 and GNR-2 over control (farmer's variety), respectively. Average extension gap was 663, 862 and 831 kg/ha during the year 2011-12, 2012-13 and 2013-14, respectively. The average technology gap ranged between 810 kg/ha to 1268 kg/ha during all the three years.

KEY WORDS :
Knowledge level, Extension gap, Scientific production, Technological gap

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BACKGROUND AND OBJECTIVES

The main mandate of KVK is transfer of technology through on and off campus trainings and also conduct the front line demonstrations of different crops on farmer's fields of the district. The conspicuous features of the district are undulating topography with steep slopes, heavy rainfall and costal region. The average rainfall of the district is about 1200 mm per annum. The rainfall distribution is erratic and thus, causing damage to crops *viz.*, pulses, paddy and other cereals. The district is composed of largely of tribal communities. The communities depend primarily on agriculture; about 60 per cent of the cultivated area is undersigned crop during monsoon.

Oryza sativa L. is grown all over the

world. India is the second leading producer of rice in the world after China. Rice is grown extensively in India on 42.41 million ha having an average yield of 2462 kg/ha (Anonymous, 2013). Annual consumption of rice in India is around 85 million tones. In India, rice is cultivated in both cropping seasons-*Kharif* and summer. In Gujarat, rice is grown in an area of 0.7 million ha with a productivity of 2143 kg/ha (Anonymous, 2013). The major rice growing districts in Gujarat are Kheda, Ahmedabad, Anand, Dahod, Navsari, Surat, Panchmahal, Vadodara and Valsad. Navsari is the leading district with the production of 111200 tonnes and productivity is also far higher (2405 kg/ha) as against the state average of 1710 kg/ha (Anonymous, 2013). Paddy is staple food of the Navsari district farmers. The soil and climate of Navsari district is most suitable for rice cultivation and production of rice can be increased through use of high yielding improved varieties and timely adoption of recommended rice production technology by the farmers. Thus, evaluation of paddy variety through front line demonstrations given by Krishi Vigyan Kendra, Navsari was felt necessary. Keeping these facts in view, the present study was undertaken with the following specific objectives:

– To study the knowledge level of farmers about the rice production technology.

– To find out the extent of adoption of rice production technology by the farmers.

– To study productivity, extension gap, technology gap and technology index of paddy

RESOURCES AND METHODS

The present study was conducted in Navsari district of South Gujarat during year 2011 to 2013. The village namely Nani kadod, Mora mogar, Partapore, Aat, Panar, Matwad, Onjal, Katasvel, Kandolpada, Zari, Chudha, Mahuvas, Kavdej, Bartad, Limzar, Vadi chundha, Panikhadak, Mograwadi, Dharmpuri and Jamanpada were selected purposively in which paddy FLDs had been given by KVK, Navsari. List of farmers to whom FLD paddy had been allotted were prepared and ten farmers from each village were randomly selected. Thus, total two hundred farmers/ respondents were selected for present study.

The data were collected by personal interview. The interview schedule was prepared by keeping the objective of the study in mind. The interview schedule was developed through discussion with expert, scientist and extension officers working in the Navsari Agricultural University, Navsari. The respondents were same for before and after FLD data collection. The data were analyzed with appropriate statistical procedures. The extension gap, technology gap and the technology index were work out with the help of formula given by Samui *et al*. (2000).

OBSERVATIONS AND ANALYSIS

The result of overall knowledge of scientific cultivation practices of paddy indicated that the farmer having low, medium and high level of knowledge before contact with KVK was 73, 20 and 7 per cent, but it was increased up to 19, 67 and 14 per cent after contact with KVK (Table 1), respectively. Similar types of result were reported by Das *et al*. (2010); Javat *et al.* (2011) and Tandel *et al*. (2014).

Data presented in Table 2 clearly indicated that majority of the farmers had medium levels of knowledge regarding different practices of paddy cultivation like high yielding varieties, time of sowing, spacing, irrigation management, weed management, time of harvesting and pest management. Whereas, majority of farmers having low levels of knowledge regarding seed rate, seed treatments, use of bio-fertilizer and fertilizer management practices.

Attempts were also made to study the extent of adoption of recommended package of practices of paddy cultivation before and after FLD conducted. The data presented in Table 3 revealed that levels of adoption of recommended practices of paddy cultivation *viz.*, new variety, seed rate, nursery management, line sowing, fertilizer management, pest and disease management, irrigation management and weed management etc. were also increased after FLD's conducted.

The results obtained during the three year are presented in Table 4. The results show that the paddy variety of NAUR-1, GNR-3,GNR-2 produced average highest yield of 4438, 5155 and 3603 kg/ha during the year 2011-12, 5203, 4814 and 4554 kg/ha during the year 2012-13 and 4826, 4544 and 4162 kg/ha during the year 2013-14 under FLD plots as compared to farmer plots, respectively. The per cent increase yield of 25.9, 23.03 and 3.0 per cent during the year 2011-12, 32.22, 19.36 and 13.3 per cent during the year 2012-13 and 30.9, 22.1 and 14.5 per cent during the year 2013-14 were found

under the paddy variety NAUR-1, GNR-3 and GNR-2 over control (farmer's variety), respectively.

The benefit cost ratio of 2.9, 3.37 and 1.8 during the year 2011-12, 2.6, 2.59 and 2.36 during the year 2012-13 and 2.96, 2.92 and 2.66 were recorded higher under the FLDs of paddy variety NAUR-1, GNR-3 and GNR-2

Table 1 : Distribution of farmers according to overall knowledge of scientific cultivation practices of paddy **(n= 200)**

Category	Before contact with KVK		After contact with KVK	
	F	%	F	%
Low level of knowledge (Below 60 score)	146	73	38	19
Medium level of knowledge (61 to 75 score)	40	20	134	67
High level of knowledge (Above 75 score)	14	7	28	14

Table 2 : Practice wise level of knowledge of farmers regarding paddy cultivation technology **(n=200)**

Sr. No.	Package of practices	Low	Medium	High
1.	High yielding variety	26	111	63
2.	Seed rate	124	61	15
3.	Seed treatment	129	52	19
4.	Use of bio fertilizer	141	47	12
5.	Time of sowing	9	121	70
6.	Plant to plant and row to row spacing	57	113	30
7.	Fertilizer management	98	54	48
8.	Irrigation management	8	123	69
9.	Weed management	38	114	48
10.	Time of harvesting	21	107	72
11.	Pest management	50	102	48

Table 3 : Extent of adoption of recommended package of practices of paddy crop before and after FLDs **(n = 200)**

Sr. No.	Package of practices	Adoption of recommended practise (Before FLD)		Adoption of recommended practise (After FLD)	
		No.	Per cent	No.	Per cent
1.	New variety				
	NAUR-1	16	08	78	39
	GNR-3	36	18	84	42
	GNR-2	08	04	38	19
2.	Seed rate	30	15	112	56
3.	Nursery management	44	22	118	59
4.	Line sowing	92	46	146	73
5.	No. of plant per dibble	56	28	116	58
6.	Fertilizer application				
	Basal	96	48	142	71
	Top dressing	128	64	158	79
	Panicle emergence	78	39	106	53
7.	Pest and disease management				
	Pest control	70	35	132	66
	Disease control	48	24	106	53
	IPDM	14	7	70	35
8.	.Irrigation management	116	58	146	73
9.	Weed management				
	Pre emergence use	52	26	114	57
	Post emergence use	10	05	42	21

Table 4 : Exploitable productivity, extension gap, technology gap and technology index of paddy as grown under FLD's and existing package of practices

Year	Variety	Area (ha.)	No. of demon.	Av. yield kg/ha		% increase in yield	BCR		Extension gap kg/ha	Technology gap kg/ha	Technology index
				Demo.	Control		Demo.	Control			
2011-12	NAUR-1	263.2	1316	4438	3525	25.9	2.9	1.88	913	1562	26.03
	GNR-3	9.5	17	5155	4190	23.03	3.37	1.92	965	845	14.08
	GNR-2	35.34	137	3603	3492	3.0	1.8	1.58	111	1397	27.94
Av. (A)				4399	3736				663	1268	22.69
2012-13	NAUR-1	89.4	550	5203	3935	32.22	2.6	1.87	1268	797	13.28
	GNR-3	61.4	307	4814	4033	19.36	2.59	1.81	781	1186	19.77
	GNR-2	49.2	246	4554	4017	13.3	2.36	1.91	537	446	8.92
Av. (B)				4857	3995				862	810	13.99
2013-14	NAUR-1	31	155	4826	3686	30.9	2.96	1.92	1140	1174	19.57
	GNR-3	8	40	4544	3720	22.1	2.92	1.73	824	1456	24.27
	GNR-2	20.4	102	4162	3634	14.5	2.66	1.68	528	838	16.76
Av.(C)				4511	3680				831	1156	20.20
Av.(A+B+C)									785	1078	

over other varieties were grow by farmer's. The results clearly showed that due to increasing in level of knowledge and adoption of scientific cultivation practice, yield was increased ultimately benefit cost ratio also obtained higher. The above finding are in line with the finding of Singh (2002); Dubey *et al*. (2010); Meena and Sisodiya (2004) and Tandel *et al*. (2014). Yield of the front line demonstration trails and potentials yield of the crop was compared to estimate the yield gaps which were further categorized into technology and extension gaps (Hiremath and Nagaraju, 2009). Average extension gap was 663, 862 and 831 kg/ha during the year 2011-12, 2012-13 and 2013-14, respectively, which emphasized the need to educate the farmer's through various extension means like FLD. The average technology gap ranged between 810 kg/ha to 1268 kg/ha during the three years. Whereas in case of individual year, the technological gap ranged between 845 to 1562 kg/ha during the year 2011-12, 446 to 1186 kg/ha during the year 2012-13 and 838 to 1456 kg/ha during the year 2013-14. The average technology gap from three year of FLD programme was 1078 kg/ha. The average technology gap observed may be attributed due to dissimilarity in soil fertility status, agricultural practices and local climate condition.

The technology index indicated the feasibility of evolved technology at the farmer field. Lower the value of technology index, more is the feasibility of technology demonstrated (Sagar and Chandra, 2004). As such reduction of technology index from 22.69 per cent (2011-12) to 13.99 per cent (2012-13) exhibited the feasibility of technology demonstrated.

Conclusion :

From the above discussion, it can be concluded that knowledge level and adoption level of tribal farmers were amplified after and imparting training and conducting FLD by KVK scientists. The FLD conducted on variety of paddy at farmer's field in Navsari district revealed that farmer's could grow the newly released high yield variety of paddy. In demonstration the high yield improved variety of paddy performed better than other variety of paddy. It improved the productivity by 20.64 per cent. The productivity under FLD over farmer's practices created awareness and motivated the other farmer's to adopt new variety of paddy and other technology of paddy in the district.

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