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Knowledge Level of Direct Sown Rice Farmers in Guntur district of Andhra pradesh

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ABSTRACT

The present study was conducted in Guntur district of Andhra Pradesh during 2014-15 to study the level of knowledge of farmers about recommended technology of direct sown rice cultivation. A total of 120 respondents constituted the sample of the present study. The findings revealed that most of the respondents (35.83%) had medium knowledge level about recommended direct sown rice technology. Content analysis of knowledge statements showed that majority of the farmers have knowledge about practices like seed drilling, maturity of direct sown rice crop, recommended doses of weedicides, recommended chemicals for plant protection and suitable varieties for direct sown rice cultivation. The knowledge level of direct sown rice farmers was positively and significantly influenced by the factors like Age, Education, Experience, Training received, Source of information, Social participation, Extension contact, Innovativeness and Risk orientation. Age, Training received, Source of information, Extension contact and Innovativeness were significant with knowledge level in multiple regression.

Key words: *Direct sown rice, Knowledge.*

Rice is an important food crop of India since it is the staple food of more than 70 per cent of the population. India has largest area under rice in the world and second largest producer of rice after China. Within the country, rice occupies one-quarter of the total cropped area, contributes about 40 per cent of total food grain production and continues to play a vital role in national food and livelihood security system.

In order to meet the nation's growing population's needs, there should be a proportionate increase in food grain production. Therefore, yields of rice should be increased because further expansion of area is not possible, in fact it is declining. Therefore, sustainability of rice eco-system and ability to increase production in pace with population growth with reduced water and labour use and climate changes are major concerns in traditional rice cultivation. Direct seeded rice (DSR) is feasible alternative with good potential to save water, reduce labour requirement, mitigation of green-house gas emissions and adaptability to climate risks.

Andhra pradesh is the third largest state in India in area and production of rice. In recent years, farmers of A.P were facing severe water scarcity and labour shortage for transplanting rice seedlings in the main field at right time. Keeping in view the above facts and importance of this technology towards sustainable production of rice for the country and A.P in particular, an analytical study on direct sown rice cultivation was conducted.

MATERIALS AND METHODS

The study was carried out using ex post facto research design during 2014-15 in the Guntur district of Andhra pradesh. A combination of purposive and random sampling procedure was employed. The district was purposively selected because it has vast area under Direct seeded rice cultivation. Three mandals viz., Tsunduru, Chebrolu and Duggirala were selected purposively based on highest area in the district. From each mandal, four villages were selected randomly and from each village 10 direct sown rice farmers were randomly selected to make a total sample size of 120. The data was collected using a well structured interview schedule.

RESULTS AND DISCUSSION

1. Knowledge level of recommended direct sown rice production technology:

The distribution of respondents based on their knowledge level about direct sown rice cultivation practices was presented in Table.1. Most of the farmers (35.83%) had medium knowledge

Table 1. Distribution of direct sown rice farmers according to their level of knowledge.

(n=120)

S.No.	Category	Direct sown rice farmers	
		Frequency	Percentage
1.	Low (41-53)	36	30.00
2.	Medium (54-65)	43	35.83
3.	High (66-78)	41	34.17
	Total	120	100.00

Maximum value = 78 Range = 37 Minimum value = 41

level, 34.16 per cent and 30.00 per cent of the farmers had high and low knowledge levels about recommended direct sown rice technology, respectively. The possible reason for medium to high level of knowledge on recommended direct sown rice cultivation might be due to their middle to high schooling, high innovativeness, medium economic motivation and adequate farming experience. These findings were in conformity with those reported by Shakya *et al.,* (2008) and Ambedkar (2010).

2. Content analysis:

The findings in the Table 2. revealed that cent per cent of the farmers had full knowledge on aspects like formation of alleys or pathways for BPH control, seed drilling is the best sowing practice, early maturity of direct sown rice crop and application of recommended quantity of Bispyribac sodium (100ml/acre) at 20 DAS. This might be because of their own experience of the effectiveness of these practices.

The results of Table 2. also revealed that 75 to 100 per cent of the direct sown rice farmers had knowledge about the practices like recommended dose of Pendimethalin (1.5-2.0litres/ acre) at 1-2 DAS, highly suitable varieties for direct sown rice, sprays of Glyphosate (10ml/litre) + Ammonium sulphate (10g/litre) for weed control at 15 days prior to sowing, recommended chemical for management of Brown Plant Hopper (Buprofezin, Ethofenprox, Monocrotophos, Acephate), recommended chemical for management of stem borer (Flubendamide, Cartap hydrochloride, Chloropyriphos), recommended quantity of MOP (26 kg) to be applied, recommended seed rate (10-15 kg/acre), recommended chemical for the control of panicle mite (Profenophos, Dicofol), quantity of $ZnSO_4$ to be applied as foliar spray (2g/litre), recommended chemical for the control of blast disease (Tricyclazole, Kasugamycin, Carbendazim), dry seed treatment is with 3g Carbendazim per kg seed, recommended quantity of Cyahalofop P butyl (250-300ml/acre) at 15 DAS for controlling *Echinochloa*, panicle initiation, flag leaf and Milky stages in rice crop are moisture sensitive stages, recommended amount of Oxadiargyl (30-40g/acre) at 8-10 DAS, application of Zinc sulphate (20kg/acre) at last ploughing and Recommended chemical for the control of false smut disease (Propiconazole, Carbendazim, Copper oxy chloride). 75 to 100 per cent of the farmers know about the above technologies due to the fact that they adopt most of these technologies for plant protection and weed control.

50 to 75 per cent of the farmers had knowledge on recommended quantity of Urea (104 kg) to be applied, recommended quantity of DAP (50 kg) to be applied, recommended amount of Paraquat (5ml/litre) to spray at 5-6 days prior to sowing and recommended quantity of 2,4 D Sodium salt (400g/acre) at 35-40 DAS for control of broad leaved weeds. This might be due to the fact that majority of the farmers are having low to medium scientific orientation.

25 to 50 per cent of the farmers had knowledge about practices like recommended chemical for control of sheath blight disease (Hexaconazole, Propiconazole, Validamycin), amount of Pyrazo sulfuran ethyl (80-100g/acre) for spraying to control grassy weeds at 8-10 DAS,

Table 2. Content analysis of level of knowledge on production technology of direct sown rice farmers.

(n=120)

S.No.	Particulars*	Knowledge				Rank
		Correct		Incorrect		
		F	%	F	%	
I Agronomic aspects						
1.	Recommended seed rate(10-15 kg/acre).	107	89.16	13	10.83	**11**
2.	Optimum seeding depth(2-3cm).	40	33.33	80	66.66	**31**
3.	Amount of rainfall required for sowing of direct seeded rice(80-100mm).	18	15.00	102	85.00	**37**
4.	Highly suitable varieties for direct seeded rice (MTU1010 and MTU1001).	116	96.66	4	3.34	**6**
5.	Better sowing practice – Seed drilling.	120	100	0	0	**2**
6.	Panicle initiation, Flag leaf and Milky stages in rice crop are moisture sensitive stages.	95	79.16	25	20.84	**17**
7.	Direct Sown Rice crop maturity (7-10 days earlier).	120	100	0	0	**3**
II Nutrient management						
8.	Recommended quantity of Urea(104 kg) to be applied.	89	74.16	31	25.84	**21**
9.	Recommended quantity of DAP(50 kg) to be applied.	81	67.50	39	32.50	**22**
10.	Recommended quantity of MOP(26 kg) to be applied.	110	91.66	10	8.34	**10**
11.	Application of entire recommended Phosphatic fertilizer (50kg/acre) at last ploughing.	13	10.83	107	89.16	**38**
12.	Application of Zinc sulphate(20kg/acre) at last ploughing.	92	76.66	28	23.34	**19**
13.	Quantity of $ZnSO_4$ to be applied as foliar spray(2g/litre).	104	86.66	16	13.34	**13**
14.	Recommended amount of $FeSO_4$ + Citric acid spray (6-8g+2g/litre).	45	37.50	75	62.50	**30**
15.	Knowledge on Azotobacter.	50	41.69	70	58.33	**27**
16.	Knowledge on Phosphorus Soluble Bacteria.	50	41.67	70	58.33	**28**
III Weed management						
17.	Sprays of Glyphosate(10ml/litre) + Ammonium sulphate (10g/litre) for weed control at 15 days prior to sowing.	113	94.16	7	5.83	**7**
18.	Recommended amount of Paraquat(5ml/litre) to spray at 5-6 days prior to sowing.	76	63.33	44	36.66	**23**
19.	Recommended dose of Pendimethalin(1.5-2.0litres/acre) at 1-2 DAS.	117	97.50	3	2.50	**5**
20.	Amount of Pyrazo sulfuran ethyl (80-100g/acre) for spraying to control grassy weeds at 8-10 DAS.	54	45.00	66	55.00	**26**
21.	Recommended amount of Oxadiargyl (30-40g/acre) at 8-10 DAS.	92	76.66	28	23.34	**18**
22.	Recommended quantity of Cyahalofop P butyl (250-300ml/acre) at 15 DAS for controlling *Echinochloa.*	99	82.50	21	17.50	**16**
23.	Application of Phenoxoprop P ethyl(200-260ml/acre) at 15 DAS.	49	40.84	71	59.16	**29**
24.	Application of recommended quantity of Bispyribac sodium (100ml/acre) at 20 DAS.	120	100.0	0	0	**4**
25.	Recommended quantity of 2,4 D Sodium salt(400g/acre) at 35-40 DAS for control of broad leaved weeds.	62	51.66	58	48.34	**24**

Table 2. cont.....

S.No.	Particulars*	Knowledge				Rank
		Correct		Incorrect		
		F	%	F	%	
IV Rodent management						
26.	Poison baiting with Zinc phosphide.	23	19.16	97	80.84	**36**
27.	Poison baiting with Bromodiolone.	23	19.16	97	80.83	**35**
28.	Usage of burrow fumigators.	23	19.16	97	80.83	**34**
V Pest and disease management						
29.	Dry seed treatment is with 3g Carbendazim per kg seed.	100	83.33	20	16.66	**15**
30.	Knowledge about Economic Threshold Levels(ETLs) of insects.	32	26.66	88	78.33	**33**
31.	Recommended chemical for management of Brown Plant Hopper(Buprofezin, Ethofenprox, Monocrotophos, Acephate).	113	94.16	7	5.83	**8**
32.	Recommended chemical for management of stem borer (Flubendamide, Cartap hydrochloride, Chloropyriphos).	111	92.50	9	7.50	**9**
33.	Recommended chemical for the control of panicle mite (Profenophos, Dicofol).	106	88.33	14	11.66	**12**
34.	Recommended chemical for the control of blast disease (Tricyclazole, Kasugamycin, Carbendazim).	103	85.83	17	14.16	**14**
35.	Recommended chemical for the control of FalseSmut disease (Propiconazole, Carbendazim, Copper oxy chloride).	91	75.83	29	24.16	**20**
36.	Recommended chemical for control of sheath blight disease (Hexaconazole, Propiconazole, Validamycin).	55	45.83	65	54.16	**25**
37.	Formation of alleys or pathways for BPH control.	120	100	0	0	**1**
38.	Usage of Trichocards @ 60,000 eggs/acre.	11	9.17	109	90.83	**39**
39.	Pheromone traps @ 5/acre to monitor yellow stem borer.	37	30.83	83	69.16	**32**
40.	Favourable climate for development of blast disease.	8	6.66	112	93.33	**40**

knowledge on Azotobacter, knowledge on Phosphorus Soluble Bacteria, application of Phenoxoprop P ethyl (200-260ml/acre) at 15 DAS, recommended amount of $FeSO_4$ + Citric acid spray (6-8g+2g/litre), optimum seeding depth (2-3cm), pheromone traps @ 5/acre to monitor yellow stem borer and knowledge about Economic Threshold Levels of insects. The possible reason for only 25 to 50 per cent farmers having knowledge on these practices might be due to their high level of innovativeness. Remaining 50 per cent of the farmers having low education levels and low innovativeness had no knowledge of the above practices.

Less than 25 per cent of the farmers had knowledge on usage of burrow fumigators, poison baiting with Bromodiolone, poison baiting with Zinc phosphide, amount of rainfall required for sowing of direct sown rice, application of entire recommended Phosphatic fertilizer at last ploughing, usage of Trichocards @ 60,000 eggs/ acre and favourable climate for development of blast disease. This might be due to the utilization of sources of information from friends, family members, neighbours and relatives. Discussions with these sources imparts knowledge only on those aspects which are fully adopted and well known to them. Extension agencies must put efforts to impart awareness among the farmers about new recommended technologies.

3. Relationship between profile characteristics of direct sown rice farmers with their knowledge level:

The correlation results of different independent variables with level of knowledge of

Table 3. Correlation coefficient of profile characteristics of direct sown rice farmers with their level of knowledge.

(n=120)

S.No.	Profile Characteristics	'r' value
1.	Age	0.618**
2.	Education	0.733**
3.	Land Holding	0.063NS
4.	Occupation	0.012NS
5.	Annual Income	0.094NS
6.	Experience	0.818**
7.	Training received	0.761**
8.	Source of information	0.788**
9.	Social Participation	0.450**
10.	Extension Contact	0.885**
11.	Innovativeness	0.921**
12.	Economic motivation	-0.075NS
13.	Risk Orientation	0.192*
14.	Scientific Orientation	0.010NS

NS = Non significant ** Significant at 0.01 level of probability
* Significant at 0.05 level of probability

Table 4. Multiple linear regression analysis of profile characteristics of direct sown rice farmers with their level of knowledge.

S.No.	Profile Characteristics	Regression coefficient	Standard error	't' value
1.	Age	1.520	0.599	2.537**
2.	Education	0.046	0.345	0.133NS
3.	Land Holding	0.082	0.286	0.287NS
4.	Occupation	0.161	0.239	0.673NS
5.	Annual income	0.610	0.661	0.923NS
6.	Experience	0.753	0.589	1.277NS
7.	Training received	1.478	0.525	2.815**
8.	Source of information	0.113	0.055	2.056**
9.	Social participation	-0.054	0.094	-0.570NS
10.	Extension contact	0.412	0.189	2.186**
11.	Innovativeness	0.561	0.114	4.910**
12.	Economic motivation	-0.045	0.137	-0.330NS
13.	Risk orientation	-0.030	0.088	-0.342NS
14.	Scientific orientation	-0.108	0.072	-1.496NS

a = 33.044 R^2 = 0.8835

NS = Non-Significant * Significant at 0.05 level of probability
** Significant at 0.01 level of probability

direct sown rice farmers was presented in Table.3. The age of farmers showed positive and highly significant relationship with knowledge levels (Thiyagarajan, 2011). The education level of the farmers was positively and significantly correlated with knowledge level of direct sown rice farmers (Manjunath, 2011). Land holding was positively and non-significantly correlated with farmer's knowledge levels (Ambedkar *et al.,* 2013b). Occupation of the farmers was found to have positive and non-significant relationship with their level of knowledge (Rakesh kumar shori, 2011). Annual income of farmers showed a positive and non-significant relationship with their level of knowledge (Lakra, 2011). Farming experience of the direct sown rice farmers was positively and significantly related with their level of knowledge (Lakra, 2011). Number of trainings received was positive and significant with their level of knowledge about direct sown rice cultivation (Ashok kumar, 2012). Utilization of sources of information was positively and significantly correlated with level of knowledge on direct sown rice cultivation (Shori, 2011).

The results in Table.3. also revealed that social participation was positively and significantly related with knowledge level of direct sown rice farmers (Thiyagarajan, 2011). Extension contact was found to have positive and highly significant relationship with knowledge level (Ashok kumar, 2012). Innovativeness of the farmers was positive and highly significant with their knowledge level (Ambedkar *et al.,* 2013b). Economic motivation was negative and non-significant with level of knowledge of direct sown rice farmers (Singh *et al.,* 2009). Risk orientation of direct sown rice farmers was positively and significantly related with their knowledge levels (Thiyagarajan, 2011). Scientific orientation showed a positive and non-significant relationship with level of knowledge of direct sown rice farmers (Dhruw, 2014).

4. Multiple linear regression of profile characteristics with knowledge levels:

Table.4. reveals the results of regression analysis between independent variables (profile characteristics) and dependent variable (knowledge). The multiple regression analysis was performed to find out the extent of contribution of each variable towards knowledge level. The variables age, training received, source of information, extension contact and innovativeness were found to be positively significant at 0.01 level of probability. The R^2 value of 0.8835 indicated that all the selected fourteen independent variables put together explained about 88.35 per cent variation in the knowledge level of direct sown rice farmers.

CONCLUSION:

Most of the farmers (35.83%) had medium knowledge level, 34.16 per cent and 30.00 per cent of the farmers had high and low knowledge levels about recommended direct sown rice technology, respectively. Majority of the farmers had knowledge on practices like seed drilling, maturity of direct sown rice crop, recommended doses of weedicides, recommended chemicals for plant protection and suitable varieties for direct sown rice cultivation. The results showed that age, education, experience, training received, source of information, social participation, extension contact and innovativeness were found to be positively significant at 0.01 level of probability with the level of knowledge on direct sown rice production technology. Risk orientation was found to be positively significant at 0.05 level of probability. Land holding, occupation, annual income and scientific orientation were positively non-significant with level of knowledge. Economic motivation was negatively significant with knowledge level. Hence, there is immediate need to promote direct sown rice cultivation, focussing more on imparting knowledge on principles of direct sown rice cultivation during training programmes to the farmers.

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