



Impact of Paddy Drum Seeder FLDs on Farmers Knowledge and Adoption Levels

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ABSTRACT

Rice is a staple food for millions of people in the world, particularly in developing countries like India. The demand for rice is growing with ever increasing population. Of late, farmers involved in paddy cultivation are facing several problems viz., uncertainty in availability of canal water, paucity of labour availability coupled with hike in labour wages leads to rice cropping becomes lack luster and less profitable. By considering the above prevailing problems KVK, Darsi popularized paddy drum seeder technology through Front Line Demonstrations (FLDs) in adopted villages of Prakasam District of Andhra Pradesh from 2011 -13. An attempt was made to assess the impact of paddy drum seeder FLDs organized with respect to farmers knowledge and adoption levels. Constraints and perception of the farmers in adopting the technology were analysed for further refinement of the technology. Ninety paddy farmers who adopted the technology were purposively selected for the study purpose. Majority of the paddy farmers had correct knowledge on main field preparation (90.00%), suitable soils and mechanical weeding (86.67%), season (83.33%), variety (80.00%), seed rate (78.89%), seed soaking (77.78%) and water management (76.67%). Regarding adoption levels majority of them were fully adopting variety (91.11%), season (78.89%), seed soaking (71.11%), suitable soils (68.89%) and mechanical weeding (67.78%). Constraints expressed by the majority of the paddy farmers in adopting the technology were perfect leveling of the field (87.78%), weed management (82.22%), non-availability of weeders (75.55%), germination used to be effected by heavy rains (73.33%) and water management (62.22%). Majority of the FLD beneficiaries perceived that 7-10 days time is saved in drum seeder paddy (86.67%), Perfect leveling of the field is very difficult (85.56%), suitable to smaller areas (84.44%), low cost of cultivation (78.89%) and low incidence of pest and disease (68.89%) in paddy drum seeder technology.

Key words : Impact, Drum seeder, FLD, Paddy.

Rice is a staple food for millions of people in the world, particularly in developing countries like India. The demand for rice is growing with ever increasing population. In India more than 70 per cent of the ground and surface water is being used for Agriculture and out of this, 70 per cent is allocated to rice cultivation. Each kg of rice produced with irrigation requires 3000- 5000 litres of water (Anonymous, 2011). The demand of rice in India is increasing with increase in population and is expected to be 140 m.t by 2025 (Pandey et al., 2008).

Andhra Pradesh is the fifth largest state in India accounting for 9 and 8% of the country area and population respectively. The state has three main regions viz., coastal (9 districts), Telangana (10 districts) and Rayalaseema (4 districts) and a fairly extended tribal belt, along the Northern and North-Eastern regions. Andhra Pradesh has three major river basins (Krishna, Godavari and Penna) and

five other small rivers which drain into bay of Bengal. Rice is the principle food crop cultivated throughout the Andhra Pradesh state providing food for the growing population, fodder to the cattle and employment to the rural masses. It is cultivated in an area of 28.03 lakh ha in *Kharif* and 15.84 lakh ha in *rabi*. The main source of irrigation is canals (52.0%), tube wells (19.3%), tanks (16.25), other wells (8.8%) and other sources (3.7%). Any decline in its area and production will have a perceivable impact on the state economy and food security.

Due to rise in input costs, high competition in international market for rice and problems in managing food grain stocks in India, rapid degradation of rice ecologies due to imbalanced use of fertilizers and improper water management practices adopted, it has put tremendous pressure on the rice growers to make rice farming economically viable and ecologically sustainable.

Knowledge of farmers on recommended drum seeder paddy technology.

N=90

S.No	Recommended drum seeder package of practices	Knowledge			
		Correct knowledge		Incorrect knowledge	
		Freq	%	Freq	%
1.	Suitable soils	78	86.67	12	13.33
2	Main field preparation	81	90.00	9	10.00
3	Season	75	83.33	15	16.67
4	Variety	72	80.00	18	20.00
5	Seed rate	71	78.89	19	21.11
6.	Seed soaking	70	77.78	20	22.22
7.	Sowing	67	74.44	23	25.56
8.	Fertilizer managementNitrogen				
a)	fertilizer	65	72.22	25	27.78
b)	managementPhosphorus	54	60.00	36	40.00
c)	fertilizer managementPotash	69	76.67	21	23.33
9	fertilizer management				
a)	Weed managementPre	68	75.56	22	24.44
b)	emergenceMechanical	78	86.67	12	13.33
c)	weedingPost emergence	48	53.33	42	46.67
10.	Water management	69	76.67	21	23.33

Of late, farmers involved in paddy cultivation are facing several problems viz., uncertainty in availability of canal water, paucity of labour availability coupled with hike in labour wages leads to rice cropping becomes lack luster and less profitable, which is finally forcing farmers to give up rice cultivation citing low productivity and high labour costs as reasons. By considering the above prevailing problems KVK, Darsi popularized paddy drum seeder technology in adopted villages by using Front Line Demonstrations (FLDs) and trainings as a means of transfer of technology during 2011-13. The transplanting of rice seedlings which is a highly labour-intensive and expensive operation can be replaced by direct seeding that can reduce labour needs by more than 20 per cent in terms of working hours required (Pradhan, 1969; Santhi *et al.*, 1998). To step up the profitability in rice cultivation cost cutting technology is the only way despite of the productivity aspects. Hence several on-campus and off-campus training and demonstration programmes were organized by the KVK to make horizontal spread of the same to the end users. Due to the concerted effort the different ways and means drum seeded rice cultivation is in more than 1400 Acres in the district due to it doesn't

need nursery, seedling pulling out, transplanting. Moreover, farmer's can take up sowing with family labour/ limited labour in event of peak. An attempt was made to assess the impact of paddy drum seeder FLDs organized with the following objectives.

1. To study the knowledge and adoption levels of farmers on recommended paddy drum seeder technology
2. To analyze the constraints in adoption
3. To study the perception on paddy drum seeder technology

MATERIAL AND METHODS

Ex-post facto research design was adopted for the study. Study was conducted in five villages viz; Lakkavaram, Pulipadu, Nagambotlapalem, Lambadithanda and Alluru from Thalluru, Mundlamuru and Kottapatnam mandals of Prakasam district where Front Line Demonstrations on paddy drum seeder were organized by Krishi Vigyan Kendra, Darsi during the years 2011-12 and 2012-13. Data was collected from 90 farmers where demonstrations have been carried out. Data was collected from the sample of farmers by personal interview method using structured interview schedule. Knowledge was operationalized

Adoption of recommended drum seeder paddy technology by the FLD farmers.

N=90

S.No	Recommended drum seeder package of practices	Adoption					
		Full adoption		Partial adoption		No adoption	
		Freq	%	Freq	%	Freq	%
1.	Suitable soils	62	68.89	20	22.22	8	8.89
2	Main field preparation	59	65.56	18	20.00	13	14.44
3	Season	71	78.89	19	21.11	0	0.00
4	Variety	82	91.11	6	6.67	2	2.22
5	Seed rate	57	63.33	21	23.33	12	13.33
6.	Seed soaking	64	71.11	24	26.67	2	2.22
7.	Sowing	60	66.67	18	20.00	12	13.33
8.	Fertilizer managementNitrogen						
a)	fertilizer	42	46.67	39	43.33	9	10.00
b)	managementPhosphorus	36	40.00	48	53.33	6	6.67
c)	fertilizer managementPotash	52	57.78	26	28.89	12	3.33
9	fertilizer management						
a)	Weed managementPre	50	55.56	22	24.44	18	20.00
b)	emergenceMechanical	61	67.78	26	28.89	3	3.33
c)	weedingPost emergence	39	43.33	27	30.00	24	26.67
10.	Water management	35	38.89	48	53.33	7	7.78

Perception of the farmers on Paddy Drum seeder technology.

N=90

S.No	Statement	Perception					
		Agree		Undecided		Disagree	
		Freq	%	Freq	%	Freq	%
1.	Cost of cultivation is less in direct sown paddy due to reduced cost on nursery raising and transplanting	71	78.89	11	12.22	8	8.89
2.	Overall yield potential is increased	55	61.11	13	14.44	22	24.44
3.	There is a risk in taking up drum seeder paddy	18	20.00	10	11.11	62	68.88
4.	7-10 days time is saved in drum seeder paddy	78	86.67	7	7.78	5	5.55
5.	Perfect leveling of the field is very difficult	77	85.56	6	6.67	7	7.77
6.	Weed management is very difficult	58	64.44	22	24.44	10	11.11
7.	Non-availability of drum seeder	28	31.11	15	16.67	47	52.22
8	Drum seeder paddy cultivation is easy to practice	46	51.11	34	37.78	10	11.11
9	It could be practiced even in smaller area	76	84.44	6	6.67	8	8.89
10.	The incidence of pest and disease is low	62	68.88	22	24.44	6	6.68
11.	The yields in drum seeder paddy are sustainable	57	63.33	16	17.78	17	18.89

Constraints expressed by paddy farmers in adopting drum seeder paddy technology.

Constraint	Ferq	%
Perfect leveling of field	78	87.78
Weed management	74	82.22
Non-availability of weeders	68	75.55
Germination used to be effected by heavy rains	66	73.33
Water management	56	62.22
Insufficient time for field preparation	48	53.33

as the amount of information and understanding possessed by the paddy farmers about the practices demonstrated during the FLDs and trainings. Adoption was operationalized for the purpose of investigation as practicing the recommended and demonstrated technologies by the respondents. Knowledge and adoption of the farmers on paddy drum seeder was tested against ten items related to paddy drum seeder technology demonstrated. The package of practices recommended by Acharya N. G. Ranga Agricultural University and demonstrated by KVK, Darsi were included in the study to assess the knowledge and to measure the extent of adoption. Response for each item was analyzed using frequencies and percentages. Perception of the farmers was studied using structured schedule containing 11 statements on 3 point continuum i.e., Agree, Undecided and Disagree. To analyze constraints open ended questions were posed to the respondents.

RESULTS AND DISCUSSIONS

Knowledge of farmers on recommended paddy drum seeder technology

It is evident from table 1 that great majority of the farmers had correct knowledge on main field preparation (90.00%), mechanical weeding, suitable soils (86.67%), season (83.33%), variety (80.00%), seed rate (78.89%), seed soaking (77.78%), water management, potash fertilizer management (76.67%), pre emergence herbicides (75.56%), sowing (74.44%), nitrogen fertilizer management (72.22%) and phosphorus fertilizer management (60.00%). But considerable percent of paddy farmers had incorrect knowledge about post emergence herbicides (46.67%) and phosphorus fertilizer management (40.00%). The reason behind this scenario was they had strong

assumption that with out application of complex fertilizers throughout the crop season attaining good yields was literally impossible.

Adoptions of recommended paddy drum seeder technology by the farmers

It could be inferred from table 2 that great majority of the paddy farmers fully adopted variety (91.11%), season (78.89%), seed soaking (71.11%), suitable soils (68.89%), mechanical weeding (67.78%), sowing (66.67%), main field preparation (65.56%), seed rate (63.33%) and potash fertilizer management (57.78%). Where as considerable per cent of farmers were partially adopting phosphorus fertilizers (53.33%) and nitrogen fertilizers (43.33%). The reason for this behavior was farmers were using more fertilizer than recommended and the time of application was not as per the recommendation.

Perception of the farmers on Paddy Drum seeder technology

Majority of the paddy farmers perceived that 7-10 days time is saved due to paddy drum seeder technology (86.67%), perfect leveling of the field is very difficult (85.56%), it could be practiced even in smaller area (84.44%), the incidence of pest and diseases was low, there is no risk in taking up the technology (68.88%), weed management is very difficult (64.44%), the yields in drum seeder paddy are sustainable (63.33%), over all yield potential was increased (61.11%) and more than half of the respondents have disagreed for the statement that drum seeders are not available (52.22%). Malleswara Rao *et al.*, (2014) reported that the cost of cultivation was reduced by 26% because of mechanized paddy cultivation and net returns per acre was also increased by 34%, the

average increase in yield for the both treatments i.e. T1 and T2 (Kharif 2011, 2012 and 2013) was 10% and 14% respectively when compared with farmers practices and the crop duration was also reduced by 7-10 days by using paddy drum seeder technology. Wang and Sun (1990) noticed that duration can be shortened by 7-15 days in direct seeded rice compared to transplanted rice. Chandrasekhararao *et al.*, (2013) confirmed that crop duration was reduced by 8-10 days and yields were increased to an extent of 8.3% in Kharif and 11% in Rabi by adopting drum seeder paddy technology.

Constraints expressed by farmers in adopting drum seeder paddy technology

Perfect leveling of the field was one of major constraint expressed by the most of the respondents (87.79%), followed by weed management (82.22%), non availability of weeders suitable to drum seeder paddy ((75.55%), germination used to be effected by heavy rains (73.33%) and water management (62.22%). Pathak *et al.*, (2011) concluded that direct sown paddy faces a potential threat from high weed infestation and weed species that are difficult to control.

LITERATURE CITED

- Anonymous 2011** <http://www.rkmp.co.in>
- Chandrasekhararao C, Jitendranath S and Murthy T G K 2013** Resource Optimisation in Rice through Direct Seeding by Drum Seeder, *International Journal of Agriculture and Food Science Technology*, Vol 4(3):239-246
- Malleswara Rao S S N, Patil D V, Srihari Rao B and Rajender Reddy G 2014** Performance evaluation of a manually operated paddy drum seeder - a cost saving technology for paddy cultivation, *Agric Eng Int: CIGR Journal*, Vol. 16(1): 75
- Pandey N Vema A K and Tripathi R S 2008** Effect of planting dates and N levels on N concentration in the leaf, grain yield and N uptake by Hybrid Rice. *Oryza*, 45(1):18-22
- Pathak H , Antewari S, Sankhyan, Dubey D S, Mina.U, Virender K, Singh N, Jain and Bhatia A 2011** Direct-Seeded Rice: Potential, performance and problems – A review, *Current Advances in Agricultural Sciences*, 3(2): 77-88
- Pradhan S N 1969** Mechanization of rice cultivation. *Oryza*, 6: 67-71.
- Santhi P K, Ponnuswamy and. Chetty N K 1998** Effect of seeding methods and efficient nitrogen management practices on the growth of lowland rice. *Journal of Ecobiology*, 10(2): 123-132.
- Wang H Y and Sun T S 1990** The characteristics of machine direct-sown rice following wheat and the corresponding techniques. *Acta Agricultural Universities Jiangxiensis*, 12: 34-39.

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