RESEARCH ARTICLE

SHARE OF IPM COMPONENTS INVOLVED IN PADDY PLANT PROTECTION AT DIFFERENT VILLAGES OF JANJGIR-CHAMPA DISTRICT IN CHHATTISGARH

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Abstract: The study was carried out at the prone area of different villages in Janjgir-Champa districts of Chhattisgarh. During 2009 and 2010, the Average pooled cost of IPM components involved with respect to paddy plant protection was ranged from Rs. 147.06to 3663.14.The maximum cost of the chemical practices (Rs. 3663.14) was recorded followed by cultural practices (Rs. 851.19) and minimum (Rs. 147.06) in biological practices with the cost of share was 82.73, 19.22and 3.32percent, respectively.Descending order of the average cost of different practicesof IPM components can be ranked as biological practices<physicalpractices<cultural practices<chemical practices.On the basis of information collected from the contact farmer through personal interview, some possible reasons comes out which may be the maximum respondentsuse of chemical practices on paddy cultivation which causes several problems such as development of insecticide resistance, environmental pollution and undesirable effects on non-target organisms.

Keywords: Cost of paddy cultivation, Plant protection cost, Cost of IPMcomponent, Share of IPM cost

INTRODUCTION

India has the largest area under the rice accounting for 28.5 per cent of the global rice area.The study of potential IPM farmer cooperators in Laguna, Rola *et al* (1988) found that about 31% of respondents thought that all insects are enemies of rice.However, a few farmers identified spider, dragonfly, and grasshopper as naturalenemies of rice pests. Most farmers (80%) spray when they see theseinsects because they believe that the crop will be damaged. Most farmers (73.3%) spray as needed, when they feel that insects may damage their crop, but their idea ofneed was not related to any economic threshold.The cost incurred and returns realized from pesticide use were worked out to Rs 2054.30 ha^{-1} as reported byShende, N. V. and Bagde, N. T. (2013).It is observed that 31.67 per cent farmers were applied one spray of weedicide. The application of weedicides was not so common in the sample area. These farmer were applied weedicides might be due to unavailability of labour or high wage rate for weeding.Sarkar*et. al.*(2013) reported that the magnitude of crop loss due to pests, disease and weed infestation in paddy is very high. The actual production with attack is varied from19.36 quintal to 20.88 quintal per acre. The overall loss with attack has been found to be 3.54 quintal per acre. Similarly, the overall normal production without attack is 23.52 quintal per acre. However, the percentage loss over normal production is less (15.05 per cent) than that of percentage loss over actual production.Mishra *et al.*, 1994 they observed that the IPM techniques and skills by involving a varieties of methods like cultural, mechanical, biological and chemical have shown increase in rice yield in 40 ha of farmers field during 1983 to 1990 with low cost on plant protection inputs, resulting in net saving to the growers. Singh *et al.*, (2004) they examined the pattern of pesticide use in paddy cultivation and assessed the economic and environmental impact of adaptation of IPM practices in paddy in Haryana. Partial adoption of different IPM practices results in higher net return and reduced unit cost of production have been observed under IPM practices.The continuous use of insecticides has destroyed the natural equilibrium between *N. lugens* and its natural enemies in India. Pests which survived, build-up fasterbecause of either the absence of natural enemies or very low populations which were ineffective in preventing build-up of hoppers population (Kulshreshth and Kalode, 1976).

MATERIALS AND METHODS

The study was conducted at the prone area of different villages in Janjgir-Champa districts of Chhattisgarh. The practices applied by the farmers related to the share of IPM components over the years in each of the village during *kharif*crop season. There were ten each village in the Janjgir-Champadistricts **(***viz.*, Satrelikala, Temar, Portha, Dongiya, Jetha, Mudabhata, Parsadakala, Dumarpali, DeragarghandDorkivillages) selected for the study. In each village, ten respondents were selected randomly in potential growing area during paddy cultivation in the year 2009 and 2010. The interview schedule was formulated on the basis of objectives framed out in "English" after thorough studies and discussion with the expert prior to conduct interviews. Interview schedule was performed with the respondents in "Hindi" through proper discussion and easy response. Tools and techniques were adopted on the personal interview in collecting data

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with respondents on their observations/ experiences. Respondents were interviewed through personal interview technique with the assurance that information given by them would be kept confidential without complications in the most formal and friendly atmosphere. The cost of IPM componentsdata was processing and statistical framework used to calculatedstandard method.

RESULTS AND DISCUSSIONS

The share of IPM components involved with respect to cost incurred per ha in paddy plant protection at different villages of Janjgir-Champa district during 2009 and 2010 are presented in table- 1, 2, & 3 and fig.- 1, 2& 3.

Cultural practices

During 2009, cost of the cultural practices ranged from Rs. 676.56 to 1341.63. The maximum cost of the cultural practices (Rs.1341.63) was recorded in village V_3 followed by village V_6 (Rs.1304.03) with the minimum (Rs.676.56) in village V_7. During 2010, the cost was ranged from Rs. 542.77 to 943.57. The maximum (Rs.943.57) was recorded in village V_6 followed by village V_1 (Rs.838.34) with the minimum (Rs.542.77) in village V_8. On the basis of two years, the cost was ranged from Rs. 638.66 to 1123.80. The maximum (Rs.1123.80) was recorded in village V_6 followed by village V_3 (Rs.1074.00) with the minimum (Rs.638.66) in village V_8.

Physical practices

During 2009, cost of the physical practices ranged from Rs.16.33 to 305.69. The maximum cost of the physical practices (Rs.305.69) was recorded in village V_5 followed by village V_9 (Rs.177.67) with the minimum (Rs.16.33) in village V_4. During 2010, the cost was ranged from Rs. 45.55 to 652.35. The maximum (Rs.652.35) was recorded in village V_5 followed by village V_9 (Rs.354.18) with the minimum (Rs.45.55) in village V_4. On the basis of two years, the cost was ranged from Rs. 30.94 to 479.02. The maximum (Rs.479.02) was recorded in village V_5 followed by village V_9 (Rs.265.93) with the minimum (Rs.30.94) in village V_4.

Biological practices

During 2009, cost of the biological practices ranged from Rs. 16.33 to 305.69. The maximum cost of the biological practices (Rs.305.69) was recorded in village V_5 followed by village V_9 (Rs.177.67) with the minimum (Rs.16.33) in village V_4. During 2010, the cost was ranged from Rs. 45.55 to 652.35. The maximum (Rs.652.35) was recorded in village V_5 followed by village V_9 (Rs.354.18) with the minimum (Rs.45.55) in village V_4. On the basis of two years, the cost was ranged from Rs. 0.00 to 495.07. The maximum (Rs.495.07) was recorded in village V_3 followed by village V_{10} (Rs.268.26) with the minimum (Rs.85.82) in village V_4.

Chemical practices

During 2009, cost of the chemical practices ranged from Rs. 1499.00 to 5770.77. The maximum cost of the chemical practices (Rs.5770.77) was recorded in village V_6 followed by village V_3 (4529.35) with the minimum (Rs.1499.00) in village V_7.During 2010, the cost was ranged from Rs.1546.50 to 6874.07. The maximum (Rs.6874.07) was recorded in village V_3 followed by village V_9 (Rs.6328.09) with the minimum (Rs.1546.50) in village V_6. On the basis of two years, the cost was ranged from Rs.2220.87 to 5701.71. The maximum (Rs.5701.71) was recorded in village V_3 followed by village V_9 (Rs.5285.68) with the minimum (Rs.2220.87) in village V_7.

The overall the share of IPM components involved in paddy plant protection at different villages of Janjgir-Champadistrict,during 2009, the average cost of paddy plant protection was ranged from Rs. 112.00to 3173.13.Whereas,during 2010, the Average cost of IPM components was ranged from Rs. 96.00to 5153.14.Pooled cost of paddy plant protection was ranged from Rs. 147.06to3663.14. Prasad (1991) revealed that the hardly (23.00%) of paddy farmers used recommended varieties and more than (90.00%) of the farmers did not treat seeds before sowing. Similar type finding were reported by Mishra *et al.,* 1994 they observed that the IPM techniques and skills by involving a varieties of methods like cultural, mechanical, biological and chemical have shown increase in rice yield in 40 ha of farmers field during 1983 to 1990 with low cost on plant protection inputs, resulting in net saving to the growers. Similar finding were reported Rajendra (2000) they conducted a study in Akola district of Maharashtra state and reported that 85.40% of farmers were medium adopters of bio control measures whereas, a mere 8.00% them of were high adopters and remaining 6.56% of them were low adopters of bio control measures. Not accurate but similar finding given Singh *et al.,* (2004). They examined the pattern of pesticide use in paddy cultivation and assessed the economic and environmental impact of adaptation of IPM practices in paddy in Haryana.

Table 1. Share of IPM components involved in paddy plant protection at different villages of Janjgir-Champa**district** during 2009

Practices	Surveyed village (ha^{-1})										Av	Share
	V_1	V_2	V_3	V_4	V_5	V_6	V_7	V_8	V_9	V_{10}		(%)
Cultural	820.51	892.82	1341.63	826.79	960.14	1304.03	676.56	734.54	1201.96	800.49	**955.95**	**21.53**
Physical	104.80	176.76	93.33	16.33	305.69	77.20	46.67	84.78	177.67	36.80	**112.00**	**2.52**

Biological	0.00	0.00	690.13	111.63	0.00	466.61	0.00	0.00	356.36	356.52	**198.13**	**4.46**
Chemical	2058.92	3734.90	4529.35	1220.68	3551.01	5770.77	1499.00	2781.33	4243.26	2342.06	**3173.13**	**71.48**
Total	**2984.23**	**4804.48**	**6654.44**	**2175.43**	**4816.84**	**7618.61**	**2222.23**	**3600.65**	**5979.25**	**3535.87**	**4439.21**	**22.22**

Table 2. Share of IPM components involved in paddy plant protection at different villages of Janjgir-Champa**district** during2010

Practices	**Surveyed village (ha^{-1})**										**Av**	**Share (%)**
	V_1	**V_2**	**V_3**	**V_4**	**V_5**	**V_6**	**V_7**	**V_8**	**V_9**	**V_{10}**		
Cultural	838.34	835.39	806.37	547.96	761.29	943.57	706.33	542.77	715.44	766.95	**746.44**	**11.95**
Physical	312.45	245.82	143.07	45.55	652.35	237.99	201.93	172.66	354.18	146.55	**251.26**	**4.02**
Biological	0.00	0.00	300.00	60.00	0.00	240.00	0.00	0.00	180.00	180.00	**96.00**	**1.54**
Chemical	4167.02	4730.83	6874.07	1977.24	4097.58	1546.50	2942.73	4356.18	6328.09	4511.22	**5153.14**	**82.49**
Total	**5317.81**	**5812.04**	**8123.51**	**2630.75**	**5511.22**	**2968.06**	**3850.99**	**5071.61**	**7577.71**	**5604.72**	**6246.84**	**25.05**

Table 3. Pooled cost share of IPM components involved in paddy plant protection at different villages of Janjgir-Champa districtduring 2009 &2010

Practices	**Surveyed village (ha^{-1})**										**Av**	**Share (%)**
	V_1	**V_2**	**V_3**	**V_4**	**V_5**	**V_6**	**V_7**	**V_8**	**V_9**	**V_{10}**		
Cultural	829.43	864.11	1074.00	687.38	860.72	1123.80	691.45	638.66	958.70	783.72	**851.19**	**19.22**
Physical	208.63	211.29	118.20	30.94	479.02	157.60	124.30	128.72	265.93	91.68	**181.63**	**4.10**
Biological	0.00	0.00	495.07	85.82	0.00	353.31	0.00	0.00	268.18	268.26	**147.06**	**3.32**
Chemical	3112.97	4232.87	5701.71	1598.96	3824.30	3658.64	2220.87	3568.76	5285.68	3426.64	**3663.14**	**82.73**
Total	**Total**	**5308.26**	**7388.98**	**2403.09**	**5164.03**	**5293.34**	**3036.61**	**4336.13**	**6778.48**	**4570.30**	**4843.02**	**22.85**

*Cultural =summer deep Ploughting, Seed treatment; Physical =Light trap, pheromone trap; Biological =Trichocard, microplex, Chemical=Different groups of insecticides

* V_1= Satrelikala, V_2= Temar, V_3= Portha, V_4= Dongiya, V_5= Jetha, V_6= Mudabhata, V_7= Parsadakala, V_8= Dumarpali, V_9= DeragarghandV$_{10}$= Dorki

* Number of ten farmers in each village

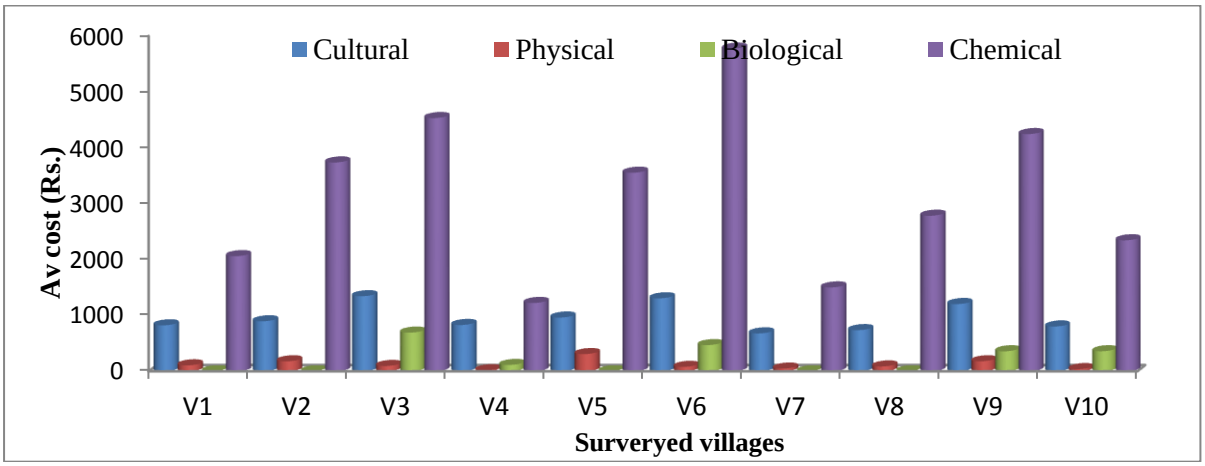

Fig. 1. Share of IPM components involved in paddy plant protection at different villages of Janjgir-Champa**district** during 2009

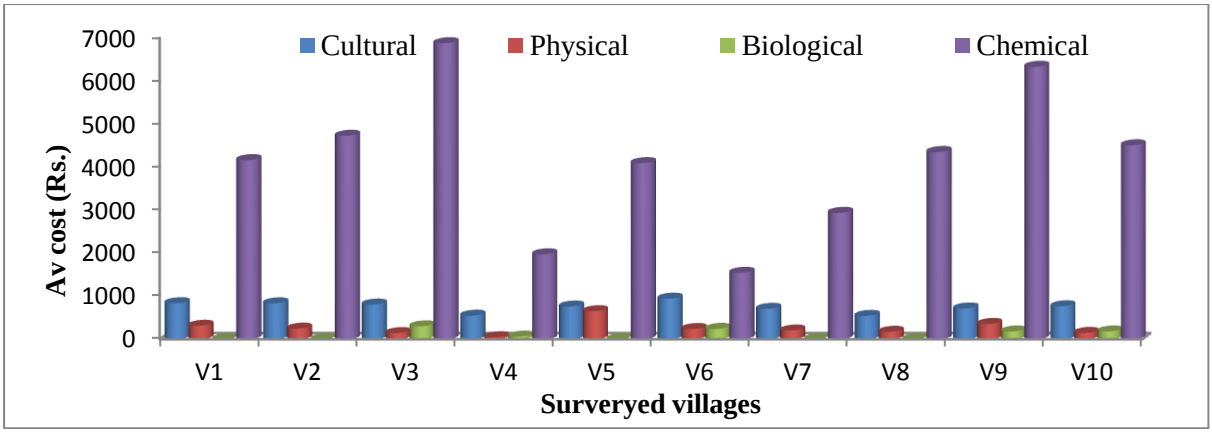

Fig. 2. Share of IPM components involved in paddy plant protection at different villages of Janjgir-Champa**district** during 2010

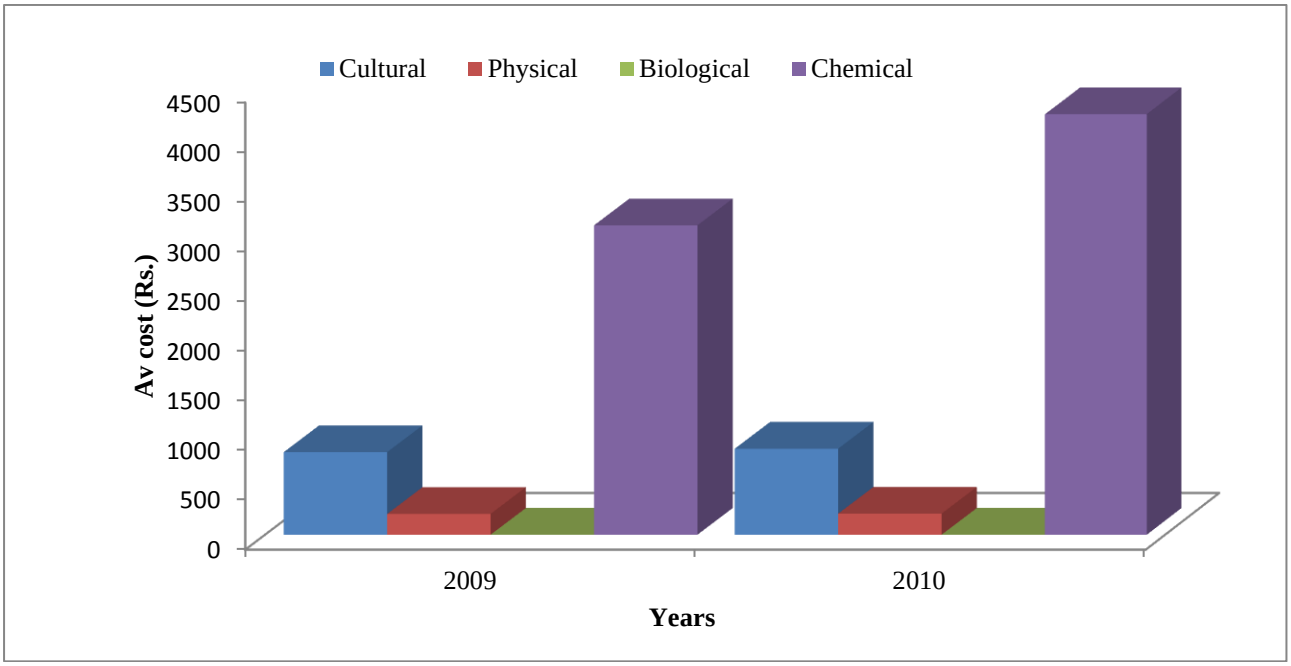

Fig. 3. Pooled cost of IPM components involved in paddy plant protection at different villages of Janjgir-Champa district during 2009 &2010

The farmers in the study area were using more quantity of pesticide. Therefore, there is an urgent need for proper education to the farmers about the balanced use of pesticides. The farmers should be educated to identify the threshold level of pest infestation and take measures only after that instead of blindly following the neighbouring farmers while applying plant protection chemicals. The farmers may be encouraged to use not only less toxic chemicals to human and livestock but also less persistent in the environment in place of more toxic and more persistent chemicals. They also need to be advised about the cultural, physical, biological practices applying and identifying the spurious techniques and methods as possible manner.

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