The Pharma Innovation Journal 2023; SP-12(11): 2037-2040

www.ThePharmaJournal.com

The Pharma Innovation

ISSN (E): 2277-7695
ISSN (P): 2349-8242
NAAS Rating: 5.23
TPI 2023; SP-12(11): 2037-2040

www.thepharmajournal.com
Received: 08-09-2023
Accepted: 16-10-2023

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To study the level of knowledge and adoption of integrated pest management on gram in rice based cropping system in Chhattisgarh plains

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Abstract
Agriculture is the main source of livelihood for over 80 Percent of the population in the Chhattisgarh state. The livelihood of these people largely depends on rice, maize and lathyrus. However, productivity of their farm produce is relatively low due to lack of technical know-how such as excessive use of pesticides on their farms. In this present study two irrigated districts namely Janjgir-Champa and Dhamtari and two rainfed districts namely Korba and Mahasamund in Chhattisgarh Plains. Form the each of the selected districts two representative blocks namely Kurud and Dhamtari from Dhamtari district and Janjgir and Champa form Janjgir-Champa district were selected purposively. Similarly, two blocks Pali and Katghora from Korba district and Mahasamund and Bagbhra from Mahasamund district were selected. From each selected block two representative villages were selected randomly. Therefore 8 irrigated and 8 rainfed villages were considered for the study. Total 16 villages were selected. From each selected village 20 representative farmers were selected randomly. In this way a total of 160 (20X8) farmers from irrigated and 160 (20X8) farmers from rainfed area were selected. Thus total 320 farmers were considered as respondents for the present study. Most of respondents (75.0%) had knowledge about use of NPK as basal dose as well as other cultural and mechanical insect control measures were well known by the respondents whereas 79.37 Percent respondents had knowledge of biological control. It has been observed that the 68.78 Percent respondents had well-versed for use of chemical insecticide that is monocrotophos against pod borer. As for adoption as of IPM in gram is concerned respondents were adopting IPM techniques particularly cultural practices ranging from 90-100 percent. Whereas controlling the hairy caterpillar and grass butterfly through organophosphate only 58.12 Percent respondents had adopted this technique 79.37 Percent respondents had adopted to use the neem oil to control the leaf hopper in gram.

Keywords: Gram, hairy caterpillar, pod borer, IPM

1. Introduction
Agriculture is the main source of livelihood for over 80 Percent of the population in the Chhattisgarh state. The livelihood of these people largely depends on rice, maize and lathyrus. However, productivity of their farm produce is relatively low due to lack of technical know-how such as excessive use of pesticides on their farms. Most of the farmers in the Chhattisgarh State do not follow the guidelines for the use of these pesticides and therefore causing harm to themselves and the crops in over or under use dosage of these chemicals. Some farmers sometimes lost their crops due to over dosage which burned the crops or using the wrong chemical which is under mining the food security in the country.

Temperature is the most important environmental factor that affects rice-based cropping systems in India. The rice crop is prone to stress throughout the crop growth period. Several problems in multiple-cropping systems, such as growing season stress, deterioration of soil physical and chemical properties, stress in labor utilization and onslaught from different pests such as insects, nematodes, diseases, weeds and rats. Adoption of IPM strategies is considered the best solution to tackle the pest problem. IPM is an ecosystem-based strategy that focuses on long-term prevention of pests or their damage through a combination of techniques such as biological control, habitat manipulation, modification of cultural practices, and use of resistant varieties. Pesticides are used only after monitoring indicates they are needed according to established guidelines, and treatments are made with the goal of removing only the target organism. Pest control materials are selected and applied in a manner that minimizes risks to human health, beneficial and non-target organisms, and the environment.

2. Methodology

In this present study two irrigated districts namely Janjgir - Champa and Dhamtari and two rainfed districts namely Korba and Mahasamund in Chhattisgarh Plains. Form the each of the selected districts two representative blocks namely Kurud and Dhamtari from Dhamtari district and Janjgir and Champa form Janjgir- Champa district were selected purposively. Similarly, two blocks Pali and Katghora from Korba district and Mahasamund and Bagbhra from Mahasamund district were selected. From each selected block two representative villages were selected randomly. Therefore 8 irrigated and 8 rainfed villages were considered for the study. Total 16 villages were selected. From each selected village 20 representative farmers were selected randomly. In this way a total of 160 (20X8) farmers from irrigated and 160 (20X8) farmers from rainfed area were selected. Thus total 320 farmers were considered as respondents for the present study. The data were collected by a personal interview with the help of a pre-tested structured interview schedule.

3. Results and Discussion

Overall Extent of adoption of insect-pest management practices by the respondents of rice crop

GRAM

Table 1a: Distribution of the respondents according to the practices wise level of knowledge on IPM in chickpea. (n=160)

Sl. No	Particular	Required	%t	Not required	%
1.	Deep ploughing of the field during the summer seasons	140	87.50	20	12.50
2.	Field sanitation a roughening is necessary to kill the pest in gram	130	81.25	30	18.75
3.	Rotates the crop with non-host cereal crops like cucurbits cruciferous vegetables	60	37.50	100	62.50
4.	Apply FYM @4t/acre all around the gram plant as a guard/barrier of crops	70	43.75	90	56.25
5.	Gram seeds boiled 52C for 10 mints to prevent the anthracnose and BLB diseases	40	25.00	120	75.00
6.	Gram seeds treated with tricoderma 8-10 g/kg applied	110	68.75	50	31.25
7.	Generally 10 to 12 kg N, 20 to 30 kg P_2O_5 and 12 to 18 kg K_2O applied in the gram as a basal dose	120	75.00	40	25.00
8.	Set-up bone fire at 7 to 8 pm in the gram field to catch the insects of gram	100	62.50	60	37.50
9.	Erect the birds preaches is helpful to control the harmful insects through crow and myna etc.	130	81.25	30	18.75
10.	Timely nipping of gram plant increased production of gram	130	81.25	30	18.75
11.	Stem fly of gram could be control through use of phorate 10 percent C.G. @4kg/acre	40	25.00	120	75.00
12.	Leaf hoppers could be control by spray of neem oil @of 5 ml/Lt.	110	68.78	50	31.25
13.	Powdery mildew can be controlled in gram by maintaining the gapping	120	75.00	40	25.00
14.	Roots rots could be controlled by well drained soil	130	81.25	30	18.75
15.	Gram pod borer can be controlled by the use of monocrotophos @ 800 ml in to 200-400 Lt. of water/acer	110	68.78	50	31.25

The Table 1, depicts that 81.25 percent respondents had knowledge about benefits of establishing birds preaches those killed the harmful insect pest of gram where as 81.25percent respondents had knowledge about the benefits of timely nipping of gram plants which sprouts more branches in gram. 25 percent of the respondents know the phorates doses to control the leaf hoppers 75 percent respondents had knowledge for powdery mildew can be controlled in gram by maintaining the gapping. 81.25 percent respondents had knowledge about roots rots could be controlled by proper drained soil, 68.78 respondents had the knowledge about gram pod borer can be controlled by the use of monocrotophos and their dose.

The data revealed that the respondents were adopted cultural component of IPM in gram fairly good, 96.25 percent respondents had adopted, deep summer ploughing, 100 percent respondents adopted physical shaking of gram plants and trap crops. For mechanical component of IPM 92.51percent respondents established the birds‟ perches, 50 percent use of pheromones traps. The chemical component of IPM 53.12 percent use of 0.6 g methomyle to control the pod borer, 61.25 percent respondents adopted 2.5 ml chlorpyriphos 20 EC to control the pod borer, 58.12 percent respondents adopted Organophosphate use to control moths of hairy caterpillar and grass butterfly. Use of biological component of IPM 79.37 percent respondents adopted Use of neem oil for controlling the leaf hopper.

Table 1b: Distribution of the respondents according to over all level of knowledge on IPM in Gram

Sl. No.	Category	F	%
1	Low	24	15
2	Medium	122	76.25
3	High	14	8.75
	Total		

Mean = 21.72 S.D. = 3.21

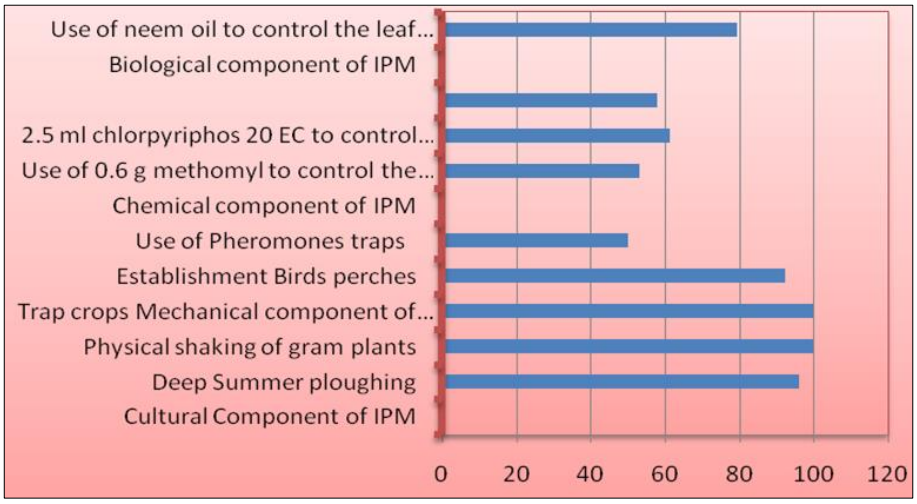
From the Table 1 (b) it has been observed that respondents having the facilities of irrigation, 76.25 percent respondents had medium level knowledge followed by 8.75 percent high level and 15 percent had low level of knowledge relating to the IPM practices in Gram in Irrigated farmers.

Table 2a: Distribution of respondents according to extent of adoption of integrated pest management practices in gram (n=160)

Sl. N.	Particular	Adoption (Irrigated Farmers)	
		F	%
	Cultural Component of IPM		
	Deep Summer ploughing	154	96.2
	Physical shaking of gram plants	160	5 100.00
	Trap crops Mechanical component of IPM	160	100.00
	Establishment Birds perches	148	92.51
	Use of Pheromones traps	8	50.0
	Chemical component of IPM	0	0
	Use of 0.6 g methomyl to control borer the pod	85	53.12
	2.5 ml chlorpyriphos 20 EC to control the pod borer	98	61.25
	Organophosphate use to control moths of hairy caterpillar and grass butterfly	93	58.12
	Biological component of IPM		
	Use of neem oil to control the leaf hopper	127	79.37

X= 5.7, S.D. = 2.5
F = Frequency

Mechanical practices followed by the respondents‟ were fairly good as 62.50 percent respondents had knowledge about erecting the birds‟ perches, 64.37 percent respondents had collect and destroyed eggs and early stage of larvae, 40.62 percent respondents had Use of yellow blue sticky trape @ 4-5 traps / acre. 56.25 percent respondents had knowledge of the biological practices that are Seed treatment with Trichoderma viride 1 percent WP @ 4 gm/kg of seed. 68.75 percent respondents had knowledge to use the chemical Quinalphase 25 EC 600 ml diluted in 200-400 liter of water/ acre against to control hairy caterpiller of mung.



Fir 1: Distribution of respondents according to their adoption regarding IPM in Gram

Table 2b: Distribution of respondents according to Overall adoption of integrated pest management practices in gram Irrigated area

Sl. No.	Category	F	%
1	Low	38	23.75
2	Medium	105	65.62
3	High	17	10.63
	Total		

From the Table 2 (b) it has been observed that respondents having the facilities of irrigation, 65.62 percent respondents had medium level knowledge followed by 10.63 percent high level and 23.75 percent had low level of knowledge relating to the IPM practices in Gram in Irrigated farmers.

4. Conclusion

Most of respondents (75.0%) had knowledge about use of NPK as basal dose as well as other cultural and mechanical insect control measures were well known by the respondents whereas 79.37 Percent respondents had knowledge of biological control. It has been observed that the 68.78 Percent respondents had well-versed for use of chemical insecticide that is monocrotophos against pod borer. As for adoption as of IPM in gram is concerned respondents were adopting IPM techniques particularly cultural practices ranging from 90-100 percent. Whereas controlling the hairy caterpillar and grass butterfly through organophosphate only 58.12 Percent respondents had adopted this technique 79.37 Percent respondents had adopted to use the neem oil to control the leaf hopper in gram.

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