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Adoption of Integrated Pest Management Practices in Black gram in Block Shahpura District Jabalpur (M.P.)

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Abstract

The study was conducted in Shahpura block of Jabalpur district to assess the adoption level of black gram growers with respect to integrated pest management practices. 120 black gram growers were selected and information collected from questionnaire, the study revealed that higher percentage (48.33%) black gram growers had medium adoption level of IPM practices followed by (41.67%) had low medium and only (10.00%) had high adoption level of integrated pest management practices. Further, it also revealed that, association between socio-psychological characteristics of black gram growers, the variable education, annual income, land holding, area under black gram, farm power, economic motivation, scientific orientation, attitude towards IPM, knowledge level of IPM practices, mass-media exposure and extension contact were found to be significant with adoption of Integrated pest management practices, whereas age, family size, and social participation of black gram growers had showed non-significant association with adoption of Integrated Pest Management practices by black gram growers.

Keywords: Integrated pest management, adoption, black gram growers

Introduction

Black gram (*vigna mungo l.*) is one of the most important pulse crop, grown across India. In India black gram is cultivated in about 25.05 lac hectares area with the production of 15 lac ton. Madhya Pradesh is stands first position in our country. In Madhya Pradesh black gram is cultivated in about 5.85 lac hectares area with the production of 2.18 lac ton (MP Krishi 2014) while in Jabalpur district black gram is cultivated in 0.27 lac hectares area with the production of 0.195 lac ton (DDA, Jabalpur). The average losses due to insect pests in mung bean and black gram crops were estimated to be 34.7 and 28.7 per cent respectively in different states of India (Asthana *et al.*, 1997) ^[2]. Lal and Ahmad (2002) ^[3] reported nearly 60 insect species on mung bean and black gram. Among these, 34 insects were serious pests on one or more of these pulse crops. Mung bean is attacked by different species of insect pests. Sucking insect pests (whitefly, jassids, and thrips) are of the major importance. These insect pests not only reduce the vigour of the plant by sucking the sap but transmit diseases and affect photosynthesis as well. Integrated Pest Management, therefore, emphasizes not only reduction in use of chemical pesticide and keeping the level of pest causing economic injury but also facilitates the use of cultural, physical, mechanical and biological method of pest control. Although, IPM is the best strategy in crop production programme, yet this practice could not reach to the farmers' field. The extent of adoption of IPM practices among farmers is not very encouraging. Keeping the above point in mind, it is necessary to study the Adoption of Integrated Pest Management practices by black gram growers.

Methodology

The present study was conducted at Shahpura block in Jabalpur district of Madhya Pradesh selected purposively because it has maximum area and low productivity of black gram in the district. A list of black gram growing villages has been prepared with the help of extension officer and 6 villages namely Umariya, Gubrakala, Keolari, Mali, Pipariya and Kaukheda were selected on the basis of larger area under black gram. From each selected villages, black gram growers were selected by using proportionate random sampling method to make the total sample size 120. The primary data was collected with the help of pre structured and pre tested interview schedule, which was prepared on the basis of objectives of the study. The data were collected and recorded in the form of interview schedule. Keeping the view of the objectives of the study and to draw logical inferences, statistical tools like frequency, percentage, Chi-square test were used for analyzing and interpretation of data.

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Result and discussion

Table 1: Practice wise adoption of Integrated Pest Management practices by black gram growers: (N*=120)

| S.N. | Integrated pest management Practices | Complete Adoption | | Partial Adoption | | Nil Adoption | |
|--------------------------------|--|-------------------|-------|------------------|-------|--------------|-------|
| | | f | % | f | % | f | % |
| A. Cultural practices | | | | | | | |
| 1 | Summer deep ploughing reduces the incidence of insect pest. | 85 | 70.83 | 06 | 5.00 | 29 | 24.17 |
| 2 | Proper time of sowing helps to minimize the incidence of insect pest. | 35 | 29.17 | 60 | 50.00 | 25 | 20.83 |
| 3 | Proper use of seed rate. | 30 | 25.00 | 32 | 26.67 | 58 | 48.33 |
| 4 | Clean cultivation helps to reduce the incidence of insect pest. | 55 | 45.83 | 36 | 30.00 | 29 | 24.17 |
| 5 | Use of balance dose of fertilizer mainly potash to reduce the incidence of insect pest. | 10 | 8.33 | 28 | 23.33 | 82 | 68.34 |
| 6 | Crop rotation helps to minimize the incidence of insect pest. | 45 | 37.50 | 42 | 35.00 | 33 | 27.50 |
| 7 | Inter-cropping. | 15 | 12.50 | 22 | 18.33 | 83 | 69.17 |
| 8 | Sowing of insect resistant variety such as COBG.671, UL310, and T9 helps to reduce the incidence of insect pest. | 36 | 30.00 | 62 | 51.67 | 22 | 18.33 |
| 9 | Removal and destruction of stubble of previous crop. | 38 | 31.67 | 55 | 45.83 | 27 | 22.50 |
| 10 | Guard crop such as maize, sorghum, bajra helps to minimize the incidence of insect pest. | 15 | 12.50 | 12 | 10.00 | 93 | 77.50 |
| B. Mechanical practices | | | | | | | |
| 11 | Sticking traps are used to attract sucking pest. | 04 | 3.33 | 20 | 16.67 | 96 | 80.00 |
| 12 | Destroying the infested part of plant help to reduce the incidence stem fly... | 25 | 20.83 | 32 | 26.67 | 63 | 52.50 |
| 13 | Trench digging surrounding the field | 02 | 1.67 | 08 | 6.67 | 110 | 91.67 |
| 14 | Rouging | 03 | 2.50 | 09 | 7.50 | 108 | 90.00 |
| 15 | Pheromone traps are used to attract male moth. | 00 | 00 | 05 | 4.17 | 115 | 95.83 |
| 16 | Hand picking and destruction of larvae/eggs | 14 | 11.67 | 20 | 16.66 | 86 | 71.67 |
| 17 | Installing perches for birds | 35 | 29.17 | 65 | 54.16 | 20 | 16.67 |
| 18 | Light traps are used to attract adult insect | 12 | 10.00 | 22 | 18.33 | 86 | 71.67 |
| C. Biological control | | | | | | | |
| 19 | Spray of 2% Neem oil help to reduce the incidence of insect pest. | 09 | 7.50 | 36 | 30.00 | 75 | 62.50 |
| 20 | Seed treatment with <i>Trichoderma viride</i> @4-5g/kg seed | 16 | 13.33 | 45 | 37.50 | 59 | 49.17 |
| 21 | Spraying NPV. One spray of either <i>Bacillus thuringiensis</i> or <i>Beauveria bassiana</i> bio-pesticide 15 days after the spray of chemical insecticide | 00 | 00 | 04 | 3.33 | 116 | 96.67 |
| 22 | Application of bio-pesticide after 15 days interval of application of chemical insecticide. | 08 | 6.67 | 28 | 23.33 | 84 | 70.00 |
| D. Chemical control | | | | | | | |
| 23 | At the time of sowing soil treatment through Phorate 10G 15Kg/hac. Help to reduce the incidence of stem fly. | 09 | 7.50 | 28 | 23.33 | 83 | 69.17 |
| 24 | Spray of Trizophos 40EC 800ml/hac. Or Chloropyriphos 20EC@1500ml/hac.duringflowering stage. | 62 | 51.67 | 22 | 18.33 | 36 | 30.00 |
| 25 | Seed treatment with Thiram+Carbendazim (2:1) i.e.2gm Thiram+1gm Carbendazim per kg seed should be done. | 35 | 29.17 | 18 | 15.00 | 67 | 55.83 |
| 26 | Seed treatment through Thiomethaxone 3-4gm/Kg seed. | 24 | 20.00 | 20 | 16.67 | 76 | 63.33 |

N*=Number of respondents

(A) Cultural practices

It is observed from the Table 1 that out of the total black gram growers adopted cultural practices viz. summer deep plugging 70.83 percent, proper time of seed sowing 29.17 percent, proper use of seed rate 20.00 percent, clean cultivation 45.83 percent, use of balance dose of fertilizer mainly potash 8.33 percent, crop rotation 37.50 percent, inter cropping 12.50 percent, use of resistance varieties 30.00 percent, removal and destruction of stubble of previous crop 31.67 percent while the adoption of guard crops 12.50 percent.

(B) Mechanical practices-

Table 1 indicated that out of the total black gram growers adopted mechanical practices viz. sticking traps are used to attract sucking pest 3.33 percent, destroying the infested part of plant 20.83 percent, trench digging 1.67 percent, rouging (MYMV infected plant) 2.50 percent, pheromone traps are used to attract male moth zero percent adopted, hand picking and destruction of larvae/eggs 11.67 percent, installing perches for birds 29.17 percent while the adoption of light traps are used to attract adult insect 10.00 percent.

(C) Biological practices

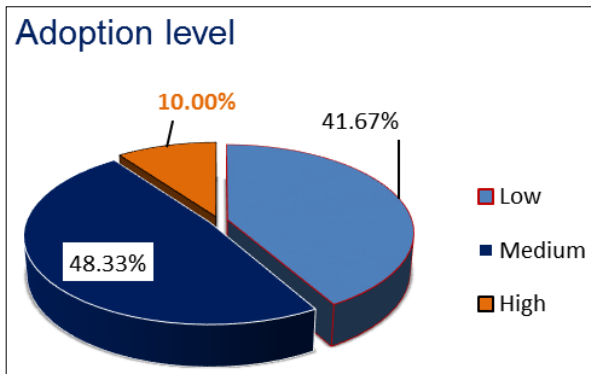
With respect to biological control Table 1 showed that out of the total black gram growers adopted viz. spray of 2% neem oil help to reduce the incidence of insect pest 7.50 percent, seed treatment of *Trichoderma viride* 13.33 percent, spraying NPV and *Bacillus thuringiensis* bio-pesticide zero percent adopted while the adoption of application of bio-pesticide after 15 days interval of application of chemical insecticide 6.67 percent.

(D) Chemical control

Regarding chemical control Table 1 revealed that out of the total black gram growers adopted viz.time of sowing soil treatment through Phorate 10G 7.50 percent, spray of Trizophos 40EC 800ml/ha. and Chloropyriphos 20EC 1500ml/ha. During flowering stage 51.67 percent, seed treatment with Thiram + Carbendazim 29.17 percent while the adoption of seed treatment through Thiomethaxone 3-4gm/kg seed 20.00 percent.

Table 2: Overall adoption level of integrated pest management practices by Black gram Growers.

| S. No. | Categories | Frequency | Percentage |
|--------|-------------------------|-----------|------------|
| 1. | Low (up to 17 Score) | 50 | 41.67 |
| 2. | Medium (18 to 34 Score) | 58 | 48.33 |
| 3. | High (35 to 52 Score) | 12 | 10.00 |
| Total | | 120 | 100.00 |



The Table 2 showed that out of total black gram growers, 48.33 per cent had medium adoption level of IPM practices followed by 41.67 per cent had low medium and only 10.00 per cent had high adoption level of integrated pest management practices.

Conclusion

On the basis of results of this study, it may be concluded that the higher percentages (48.33%) of the black gram growers were found medium adoption of integrated pest management practices. The study further revealed that association between socio-psychological characteristics of black gram growers, the variable education, annual income, land holding, area under black gram, farm power, economic motivation, scientific orientation, attitude towards IPM, knowledge level of IPM practices, mass-media exposure and extension contact were found to be significant with adoption of Integrated pest management practices, whereas age, family size, and social participation of black gram growers had showed non-significant association with adoption of Integrated Pest Management practices by black gram growers.

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