

International Journal of Statistics and Applied Mathematics

ISSN: 2456-1452
Maths 2024; SP-9(2): 93-95
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<https://www.mathsjournal.com>
Received: 03-02-2024
Accepted: 07-03-2024

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Analysis of constraints and suggestions experienced by farmers while using Mexican beetle for eradication of parthenium

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Abstract

In the Marathwada region of Maharashtra state, the current study was carried out in 2022–2023 with the goal of "to know the constraints faced by farmers in use of Mexican beetle for eradication of parthenium and to obtain their suggestions". Parbhani district in the state of Maharashtra was chosen for the study. Four villages from each tehsil/mandal were chosen with a significant number of farmers utilizing Mexican beetle, and three tehsils-Selu, Purna, and Jintur-had a significant number of farmers using Mexican beetle. Ten respondents were chosen at random from each village that was considered, making the sample size 120. Ex-post-facto research design was used for the study. Data was gathered using a well-structured interview schedule created with the study's objective in mind. The respondents were asked to mention their views about constraints faced while using Mexican beetle. The responses about constraints were obtained by using close end questions. The responses were quantified and ranked. Also with the objective of eliciting suggestions of respondents regarding the use of Mexican beetle, respondents were asked to give their view points to promote use of Mexican beetle. Later suggestions were sought by using open-ended questions. Further the responses were quantified and ranked. To interpret findings and draw conclusions, statistical tools such as frequency and percentage were used.

Keywords: Mexican beetle, constraints, suggestions, parthenium, eradication

Introduction

Parthenium hysterophorus L. is an herbaceous erect and annual plant belonging to the family "Asteraceae" (Compositae). In India, it is commonly known as congress grass, carrot weed, white top, starweed, gajar grass, The lightness of the seed, prolific seed production, adaptability to wide range of habitats, drought tolerance, its ability to release toxic chemicals against other plants, and its high growth rate allows it to colonize new areas quickly and extensively. *P. hysterophorus* has entered accidentally in India with imported food grains. Its occurrence was first reported from Pune (Maharashtra) in 1955 (Rao, 1956) [3] Now it has become one of the main weed in almost all types of agricultural lands besides infesting wasteland, community land, road and railway track sides and forests. It is more known due to its properties to cause health hazards to man and animals besides causing loss to crop productivity and plant biodiversity. It is a threat to livestock as it reduces the availability of fodder in pastures and is toxic when ingested. Ever since the *P. hysterophorus* became a serious menace in India and many other countries, efforts are being made to manage the weed by different methods but, so far no single method has been proved satisfactorily, as each method suffers from one or more limitations. Manual uprooting of parthenium is possible only in limited area. Chemical control becomes expensive especially for a developing country like India. As the parthenium is a weed of wasteland, fallow land and vacant land, bio-intensive integrated management will be the most suitable option.

Efforts on biological control of parthenium through insects were initiated in India with the introduction of *Z. bicolorata* in 1983. After first release of *Z. bicolorata* in Bangalore (Karnataka) in 1984, the bioagent has widely spread across the country (Varshney and Sushilkumar, 2007) [4]. Both adults and larvae of *Z. bicolorata* are capable to feed on leaves, terminal buds and leaf blades of parthenium weed.

Taking into consideration the magnitude of losses at farm level, it is evident that there is a need to adopt the control measure practices of parthenium weed, so that we can mitigate the losses. There is thus a need to collect the information about the attitude of farmers towards control measure practices of parthenium weed and identify the various problems faced by them during adoption of biological control measure practices of parthenium weed.

Methodology

The present study was conducted with the main objective to know the constraints faced by farmers in use of Mexican beetle for eradication of parthenium and to obtain their suggestions. The study was conducted in Parbhani district of Marathwada region of Maharashtra. There are nine tahsils in Parbhani district viz., Parbhani, Gangakhed, Sonpeth, Pathri, Manwath, Palam, Selu, Jintur and Purna. Out of that, three tahsils were purposively selected for the research purpose

namely Selu, Jintur and Purna on the basis of maximum number of farmers using Mexican beetle. From each selected tehsil 4 villages were selected purposively on the basis of maximum number of farmers using Mexican beetle. From each selected village 10 farmers were selected randomly to compromise total 120 respondents for the study.

The data was collected by personal interview and “Ex-Post-Facto” research design was used for conducting the study. The collected data was processed and statistically analyzed by using statistical tools like frequency and percentage, mean, standard deviation and coefficient of correlation. The independent variables were education, family size, farming experience, economic motivation, scientific orientation, knowledge level, land holding, annual income, social participation, extension contact, mass media exposure, risk orientation and the only dependent variable was attitude.

Results and Discussion

Table 1: Constraints faced by farmers while using Mexican beetle

Sr. No.	Constraints	F	%	Rank
1	Mexican beetle eats only leaves but do not destroy parthenium completely.	69	57.50	I
2	Migration of beetles from own field to another’s field.	62	51.67	II
3	Less number of visits of village level extension workers.	44	36.67	III
4	Non-arrangement of farmer’s rallies and campaigns.	31	25.83	IV
5	Non-availability of Mexican beetles.	13	10.83	V
6	Due to deep ploughing pupation of beetles get disturb.	8	6.67	VI

It was revealed from Table 1 that, 57.50 per cent faced constraint that Mexican beetle eats only leaves but do not destroy parthenium completely, 51.67 per cent of the respondents faced constraint of migration of beetles from own field to another’s field, 36.67 per cent faced constraint of less number of visits of village level workers, 25.83 per cent faced the constraint of non-arrangement of farmer’s rallies and campaigns, 10.83 per cent faced constraint of non-availability of Mexican beetle and 6.67 per cent of them faced constraint that due to deep ploughing pupation of beetles get disturb.

Table 2: Suggestions given by the farmers to overcome constraints faced while using Mexican beetle

Sr. No.	Suggestions	F	%	Rank
1	Counter negative perception about Mexican beetle by organizing farmer’s rallies, fairs and campaigns.	78	65.00	I
2	Research should be conducted to destroy root system of parthenium.	71	59.17	II
3	Increase participation of village level extension workers to create awareness and develop positive attitude.	65	54.17	III
4	Reduce use of herbicides and weedicides.	54	45.00	IV
5	Increase production of Mexican beetle by state agricultural universities.	23	19.17	V
6	Farmer must follow crop rotation.	18	15.00	VI

According to the table 2 the suggestions given by respondents to overcome constraints are farmers’ rallies, fairs and campaigns should be organised by the extension workers (65.00 per cent), research should be conducted to destroy root system of parthenium (59.17 per cent), participation of village level extension workers should be increased to create awareness and positive develop attitude (54.17 per cent), use of herbicides and weedicides should be reduced (45.00 per

cent), production of Mexican beetles should be increased by state agricultural universities (19.17 per cent) and farmers should follow crop rotation (15.00 per cent).

Conclusion

From the above constraints and suggestions it can be concluded that, farmer’s rallies, fairs, campaigns, etc., should be organized by the extension workers to spread the awareness about use of Mexican beetle and to counter negative perception about Mexican beetle. Research should be conducted on root system destruction of parthenium by the scientists as Mexican beetle only because defoliation of parthenium weed. If the participation of village level extension workers is increased, it leads to transfer the new ideas and technologies to the remote areas and to upgrade their knowledge. This will be helpful in changing farmer’s attitude from less favourable to favourable and favourable to highly favourable and in adopting such innovations.

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