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Seasonal incidence and leaf damage percentage of hadda beetle (*Epilachna vigintioctopunctata* Fab.) in spine gourd

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Abstract

Hadda beetle *Epilachna vigintioctopunctata* Fab is one of the fundamental pest of backbone gourd in hill region of Chhattisgarh. It commonly known as epilachna beetle or spotted leaf-consuming beetle that one of the severe detrimental pest of cucurbit vegetation, especially backbone gourd. Assessment of the seasonal incidence of hadda beetle allows in knowledge the populace fluctuation of those pests and consequently their effective management. A field survey became achieved at weekly c programming language, each the stages of larvae (grubs) and adults of hadda beetle populace happened patiently all through whole crop growing season in Kharif at some point of 2019-20 in Ambikapur C.G. The height of (6.4 beetles/plant) populations and (thirteen. Forty seven leaf damage) percentage had been located during remaining week of August (35th SMW). The least (0.40 beetle/plant) populations with leaf harm percentage of (three. 07%) were determined at some point of first week of October (fortieth SMW). The correlations between hadda beetle and abiotic elements shows that non-enormous and superb correlation. At the same time as, the leaf harm percent and the abiotic elements indicates non-extensively fantastic correlation with the most temperature, minimum temperature and morning relative humidity and rainfall except night relative humidity.

Keywords: Abiotic, hadda beetle, incidence and seasonal, backbone gourd

Introduction

Backbone gourd (*Momordica dioica* Roxb.) belongs to “Cucurbitaceae” family and has “Momordica” as a genus (Trivedi and Roy, 1972) [145]. It is originated in Indo- Malayan location (Rashid, 1976) [13]. It's miles an underutilized and unexploited rhizomatous, perennial, dioecious fruit vegetable. It's far a nutritious vegetable crop and regionally called Kakrol (in Bengali), Kheksa and Kheksi (in Chhattisgarhi). Kankoda, Kantola, Kartoli, Kantoli, Meetha Karela, Padora, Bhaat Karela, Kankro and Bhat korola and so forth. In specific localities. The crop is popularized a number of the farmers due to its vegetable dietary price and its shelf existence. The spotted leaf beetle, *HenosEpilachna vigintioctopunctata* (F.) is an vital pest of the solanaceous (e.G. Brinjal, tobacco, tomato, potato, and many others.) and cucurbitaceous (e.G. Gourds, melon, cucumber, and so forth.) flora in India (Krishnamurti, 1932; Puttarudriah and Krishnamurti, 1954) [6, 9]

Incidence of insect pests is the predominant one. Cucurbits are significantly stricken by *Epilachna* beetle, pink Pumpkin beetle, Cucurbit Fruit fly and many others. Amongst them, *Epilachna* beetle is the most devastating pest causing sizeable harm can also as much as eighty% of the host plant life relying on region and season (Rajagopal and Trivedi, 1989) [10-11]. The high prevalence of the pest has been said all through temperature range of 24 to 31 °C and relative humidity 58-75% RH within the area (Ramzan *et al.*, 1990 and Ghosh and Senapati, 2001) [12, 3].

Each grubs and adult beetles cause damage to the flora. Infestation basically starts just after hatching of egg mass (Murata *et al.*, 1994) [7]. The grubs start their feeding gregariously and later dispersed to the following plant life. The grubs feed on the decrease epidermal layer of leaves whereas the adults feed irregularly upon the top surface of leaves by scraping ensuing internet like appearance. On occasion it's far known as a leaf scrapping coccinellid beetle (Imura and Ninomiya, 1978) [4]. The 0.33 and fourth instars of grubs are maximum unfavourable. An infested leaf will become brown in coloration, dries up and finally defoliated (Pradhan *et al.*, 1990) [8]. Therefore, vegetative increase and improvement of the vegetation are harmed inflicting full-size discount of their yields (Alam, 1969; Rajagopal and Trivedi, 1989) [1, 10-11].

For the effective control, and it's miles necessary to have primary facts at the incidence of the pest with regards to climate parameters which in turn assist us in determining suitable time of action and suitable management techniques to be followed. Retaining this in view, the existing look at made an try to record periodicity of prevalence of epilachna beetle in terms of diverse abiotic elements as a assist to conform an effective and inexpensive strategy of control.

Materials and Methods

Observations of seasonal incidence of hadda beetle in spine gourd have been recorded by direct counting the entire variety of pest (grub and grownup) population at weekly periods from randomly decided on five plant in three blocks after look of the pest infestation all through the entire duration of crop growing season. Leaf damage resulting from hadda beetle turned into recorded by using direct counting the entire number of infested leaves and wholesome leaves, and calculated the infestation percent in spine gourd. The samples have been stored unfastened from any insecticidal remedy for the duration of the study period. All statistics were recorded regularly and correlated with meteorological observations to ascertain the results of abiotic factors.

$$\text{Leaf infestation (\%)} = \frac{\text{Number of infested leaves}}{\text{Total number of leaves}} \times 100$$

Results and Discussions

The populations then multiplied step by step and reached to its peak of 6. Four beetles/plant and 13.47 percentage of leaf damage all through ultimate week of August (thirty fifth SMW) when corresponding common most and minimum atmospheric temperature 30.1 °C and 22.8 °C, morning and night relative humidity ranged from 97% and 71%, respectively with 14.5 mm average rainfall. But, after attaining top, a lowering fashion become observed till first week of October (40th SMW), the imply populations of hadda beetle and leaf damage percentage were 0.40 beetle/plant and

three. 07% respectively, while the most temperature, minimum temperature, morning relative humidity, evening relative humidity and rainfall had been 27.7 °C, 20. Three °C, ninety seven%, seventy six% and a pair of.70 mm, respectively.

On operating out the correlation between hadda beetle population and the abiotic factors which include maximum temperature ($r = 0.180$), minimal temperature ($r = \text{zero}.478$), morning relative humidity ($r = \text{zero}.349$), night relative humidity ($r = 0.056$) and rainfall ($r = 0.295$) suggests that non-substantial and nice correlation. Further, the leaf damage percent and the abiotic factors suggests non-extensively high-quality correlation with the most temperature ($r = 0.254$), minimal temperature ($r = \text{zero}. 204$), morning relative humidity ($r = 0.031$) and rainfall ($r = 0.053$) except nighttime relative humidity ($r = -\text{zero}. 265$) had a bad non-great impact. The existing investigation accordance with Sharma and Tayde (2017) [14], who reported that hadda beetle populace observed on final week of July (thirtieth SMW) with an average 1.2 beetle/flowers and reached to peak degree three.6 beetle/plant in the final week of August (35th SMW). The prevailing consequences also are supported with the aid of Jamwal *et al.* (2017) [5], they revealed that the seasonal abundance of hadda beetle for 2 consecutive years. The best population of *H. Vigintioctopunctata* grub populace of 3.78 grubs/plant at some stage in thirty fifth SMW and grownup beetles 5.48 adults/plant in 36th SMW. Further, Bharadiya and Patel (2005) [17], additionally said that the initial occurrence of epilachna beetle in brinjal crop from 4th week of August onwards and reached the height population of 1.30 beetle/plant in 3rd week of September. In spine gourd the peak populace (6.0 grubs/adult/plant) of hadda beetle changed into pronounced inside the second week of September 2017-18 by Anant and Painkra (2009) [2].

Venkatesha (2006) [16] reported that the peak prevalence of epilachna beetle discovered in mid August and lowest populace inside the remaining week of August all through experimental 12 months 2004-05 on a medicinal plant of *Withania somnifera*.

Table 1: Seasonal incidence of hadda beetle (*Epilachna vigintioctopunctata* Fab.) and leaf damage percentage in spine gourd during *Kharif* 2019-20.

SMW	Date of observation	Mean population of hadda beetle/plant	Mean leaf damage (%)	Temperature (°C)		Relative Humidity (%)		Rain fall (mm)
				Max.	Min.	Mor.	Eve.	
30	26/07/2019	0.67	0.27	30.4	23.1	91	73	109.3
31	02/08/2019	1.86	1.93	28.5	22.6	95	78	4.3
32	09/08/2019	3.93	3.97	29.1	22.9	96	79	33.9
33	16/08/2019	4.53	5.93	27.9	22.2	97	82	87.2
34	23/08/2019	5.33	7.07	28.8	22.1	97	78	85.7
35	30/08/2019	6.40	13.47	30.1	22.8	97	72	101.6
36	06/09/2019	4.13	11.87	29.9	23.2	93	76	18.2
37	13/09/2019	2.36	10.47	28.1	22.2	96	76	65.5
38	20/09/2019	1.40	8.73	31.7	22.1	88	62	6.3
39	27/09/2019	1.07	5.47	25.7	20.4	98	88	91.4
40	04/10/2019	0.4	3.07	27.7	20.3	97	76	19.2

Table 2: Correlation of hadda beetle population and leaf damage percentage with abiotic parameters during *Kharif* 2019-20.

Name of pest and leaf damage	Temperature (°C)		Relative Humidity (%)		Rainfall (mm)
	Maximum	Minimum	Morning	Evening	
Hadda beetle	0.180	0.478	0.349	0.056	0.295
Leaf damage (%)	0.245	0.204	0.031	-0.265	0.053

Non-Significant at 5% level of significance.

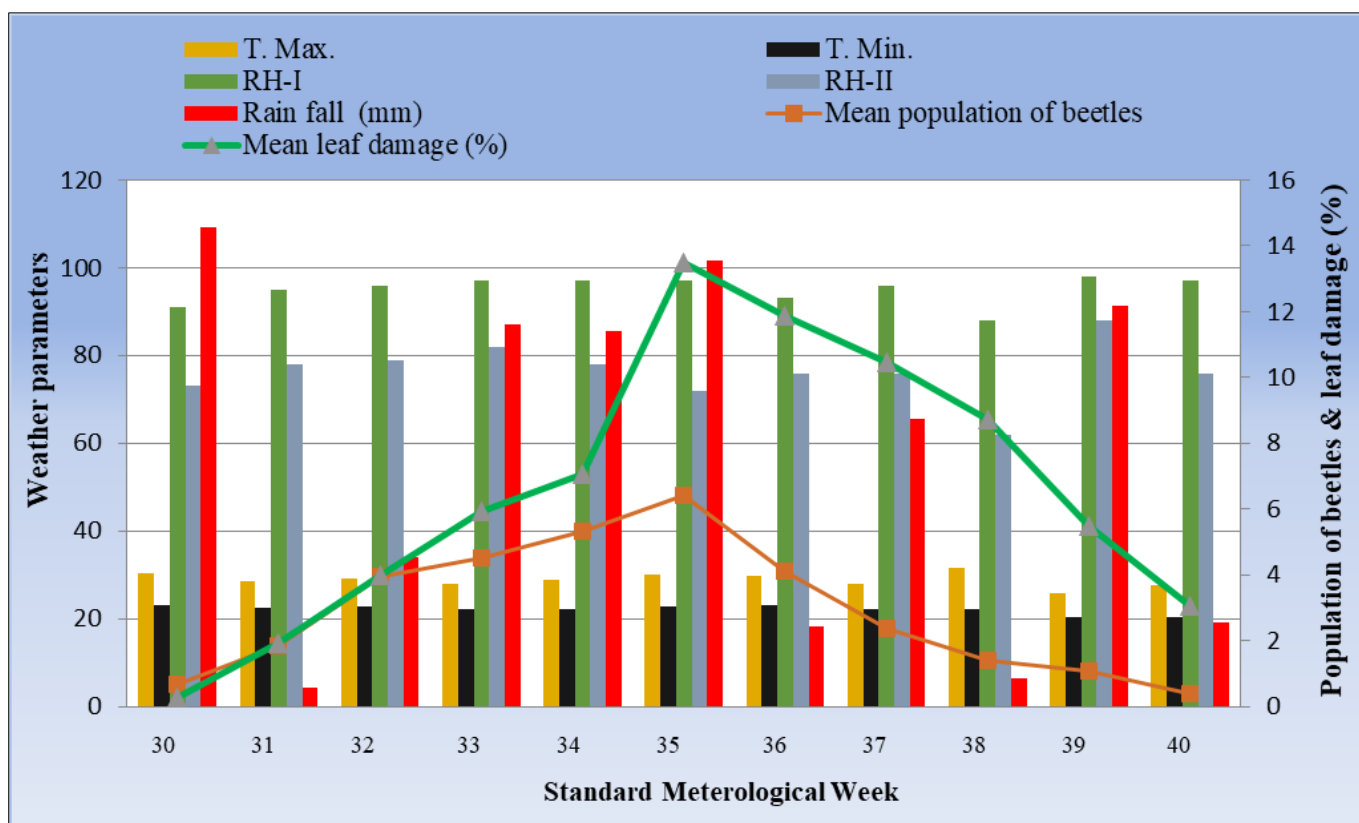


Fig 1: Correlation of hadda beetle population and leaf damage percentage with abiotic parameters during Kharif 2019-20.

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