Seasonal incidence and population dynamics of red pumpkin beetle,*(Aulacophorafoveicollis*)on bottle gourd(*Lagenaria siceraria* M.)and their Correlation with abiotic factors

Abstract

The present Investigation carried out at Students' Instructional Farm, A. N. D. U. A. & T., Kumarganj, Ayodhya (U.P.) during *Zaid*, 2022.Red pumpkin beetle was first recorded during incidence initiated in the 7thSMW (3rd week of February) with a mean population 1.4 beetles per five plants which reached its peak to maximum (21.20 beetles/five plants) during 14thSMW (1st week of April). Population of red pumpkin beetle was showed non-significant positive correlation with minimum and maximum temperature (0.067 & 0.40), maximum relative humidity and rainfallshowed non-significant negative correlation (-0.467 & -0.129) while significant negative correlation with minimum relative humidity (-0.506*).

Key words: Standard Meteorological Week, red pumpkin beetle, non-significant, minimum relative humidity and Population.

1. Introduction

Cucurbits are the most commonly grown and essential crops in the world, being planted in all tropical and subtropical countries. Cucurbits, generally known as vine crops, are made up of around 118 genera and 825 species (Khan *et al.*,2012)[2].Cucurbitaceae, or gourd family, is an excellent example of a plant family having numerous economically useful members. Bottle gourd, *Lagenaria siceraria* (Molina) Stand, belongs to the Cucurbitaceae family and is one of the most significant vegetable crops farmed in India. In India, the total area covered by Bottle Gourd was 187 ha, with a production of 3165 MT. (DES Report, 2021)[1] It is frequently farmed in India since it is a good source of minerals, it helps to avoid sodium loss and weariness, especially in the heat. It is a low-calorie diet that is beneficial to those with diabetes and jaundice. Bottle gourd also has a wide range of medical purposes, including cooling, diuretic, and cardiotonic effects. The edible portion of the bottle gourd fruit includes 96.3 percent moisture, 63 kJ (15 kcal) calories, 5.87 grammes of carbs, 0.02 grammes of fat, 0.6 grammes of protein, 10.10 milligrams of vitamin C, 3.77 milligrams of zinc, and 3320.0 milligrams of iron (Milind and Satvir, 2011)[4]. One of the most critical limiting factors for low cucurbit productivity is insect infestations. Poor quality seeds, insect pest infestations, and severe environmental conditions are all reasons that contribute to low bottle gourd production. Insect pests are the most important of them, as they have a negative

impact on plant growth and productivity. Many insect pests attack the crop, among which the *Aulacophorafoveicollis* (Lucas) and *Bactroceracucurbitae* are two prominent insect pests that attack cucurbit crops.

2. Material and methods

The seasonal incidence of the major insect pests was recorded under natural conditions of infestation in three plots each measuring 5 m x 4 m (126 m^2). During *Zaid* with row to row and plant to plant distance of 400cm x 50cm, design RBD, treatments 09, replication 03. Amongthe various insect pests infesting bottle gourd, the seasonal incidence of two major insect pests *i.e.*, red pumpkin beetle and cucurbit fruit fly were recorded on "Rashmi" variety, of Bottle gourd. Five plants per plot were randomly selected and tagged to record the observations throughout the experiment.

$$\textbf{Mean fruit infestation (\%)} = \frac{\textbf{Number of infested fruits} x^2}{\textbf{Total number of fruits}} \text{X } \mathbf{100}$$

The incidence of fruit fly was also be recorded by installing a fruit fly trap (Bardo-lure) per plot and the number of fruit flies trapped in trap were recorded regularly and expressed as mean catch per week.

3. Result and discussion

3.1. Red pumpkin beetle

The results presented in the table-1 clearly reveals that red pumpkin beetle *Aulacophorafoveicollis*(Lucas) incidence initiated in the 7th standard meteorological week (3rd week of February) with a mean population 1.4 beetles per five plants. The population extended gradually and reached its peak (21.20 beetles/five plants) during 14th standard meteorological week (1st week of April) thereafter, leaning trend was observed till the crop maturity when population of red pumpkin beetle activity gradually decreased from 20th standard week (3rd week of may) and it was lowest (1.80 beetles/five plant).These results were partially collaborated with Kumar and Saini (2018)[3] who reported that population of red pumpkin beetle on cucumber began in the last week of August and peaked (4.80 beetles/ five plant) during the first week of October. They also reported that population of red pumpkin beetle had positive correlation with mean temperature and significant negative correlation with mean relative humidity and rainfall. The results are in conformity with Rathod and Borad (2010)[6] who reported highest incidence of red pumpkin beetle during August to September in kharif season.

3.2. Correlation of red pumpkin beetle

Population of red pumpkin beetle was showed non-significant positive correlation with minimum and maximum temperature (0.067 & 0.40), maximum relative humidity and rainfall showed non-significant negative correlation (-0.467 & -0.129) while significant negative correlation with minimum relative humidity (-0.506*). Rathod and Borad (2010)[6] who reported highest incidence of red pumpkin beetle significant positive correlation with mean atmospheric temperature.

4. Conclusion

Among thehighest red pumpkin beetlepopulation recorded21.20 per plants, 14thSMW (1st week of April) while 1.80 per plant, 20thSMW (3rd week of May) ware recorded the lowest. The highest Fruit fly population was recorded50.35%, 13thSMW (5th week of March) and 4.20 %, 21stSMW (4th week of May) ware recorded the lowest.

Table1: Incidence of major insect pests of bottle gourd

S. No.	SMW	Red pumpkin beetles/5 plants	Fruit fly damage (%)
1	5	0.00	0.00
2	6	0.00	0.00
3	7	1.4	0.00
4	8	2.2	0.00
5	9	3.8	0.00
6	10	4.4	12.72
7	11	5.30	24.62
8	12	18.10	38.24
9	13	20.30	50.35
10	14	21.20	30.61
11	15	17.50	29.20
12	16	10.80	27.87
13	17	7.40	31.22
14	18	4.60	30.0
15	19	2.20	22.2
16	20	1.80	18.32
17	21	0.00	14.20

18	22	0.0	0.00

Table 2: Relation of Insect pest incidence with abiotic factors during Zaid 2022

Insect Pests	Weather Parameters				
	Temperature		Relative Humidity (%)		Rainfall
	Max.	Min.	Max.	Min.	
Red pumpkin beetle	0.400 NS	0.067 NS	-0.467 NS	-0.506 S	-0.129 NS
Fruit fly	0.653 S	0.430 NS	-0.572 S	-0.642S	0.11 NS

5. References

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