



Seasonal incidence of major insect pests of sesame with relation to weather parameters in Bundelkhand Zone of Madhya Pradesh

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ABSTRACT

A field experiment was conducted at AICRP (Sesame) centre, College of Agriculture, JNKVV, Tikamgarh (M.P.) during two consecutive kharif seasons (2013 and 2014) to assess the seasonal incidence of major insect pests of sesame and its correlation with weather parameters. The incidence of *Antigastra*, Jassid, Mirid bug and white fly were started during 31st SMW and attained their peaks during 38th, 38th, 36th and 37th SMW respectively. The correlation study revealed that the *Antigastra* larvae had significantly positive correlation with maximum temperature ($r = 0.48$) and significantly negative correlation with relative humidity ($r = -0.71$). While significant and positive correlation was observed between population buildup of jassid and maximum temperature ($r = 0.80$) and significantly negatively correlated with relative humidity ($r = -0.81$). Whereas the mirid bug population exhibited significant correlation with maximum and minimum temperature ($r = 0.72$, $r = 0.74$) and significantly negatively correlated with rainfall ($r = -0.90$). The correlation study between white fly population and weather parameters revealed that the positive correlation with maximum and minimum temperature and negatively correlated with relative humidity and rainfall.

Keywords: Pest Incidence, Correlation, sustainable livelihoods, Farming.

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INTRODUCTION

Sesame (*Sesamum indicum* Lin.) known as the "queen of oil seeds" is one of the most ancient oilseed crop of the world. In India, it is grown in the entire crop growing season's viz., kharif, late kharif, rabi, and summer seasons [1]. In India it is grown on 1.78 million ha with a total production of 0.81 million tonnes with very poor average productivity of 456 kg ha⁻¹ as compared to the world average productivity of 518 kg ha⁻¹ [2]. The main reasons of low productivity of sesame are its rain fed cultivation in marginal and sub marginal lands under poor management practices. Damage due to insect pests is also one of the major factors causing low productivity. The crop is attacked by 29 species of insect pests in different stages of its plant growth [3]. Among these, leaf roller and capsule borer (*Antigastra catalaunalis* Dup.) are major insect pest in all sesame growing areas in India. It damages the crop at all three stages viz., vegetative, flowering and maturity. Newly hatched larvae feed the young leaves and shoot tips and at a later growth stage they roll the leaves together and feed inside. There after feed on flowers, pods and seeds. In Bundelkhand zone of Madhya Pradesh sesame is grown in kharif season. Activity of *Antigastra* is observed high during the month of August to October. Therefore, in Bundelkhand region *Antigastra* is a key insect pest of sesame and causing economical loss to an extent of 43.1% [5]. Nymph and adults of some sucking insect pests, jassid (*Orosius albicinctus* Distant), mirid bug (*Nesidiocoris tenuis* Rent.) and white fly (*Bemisia tabaci* Gennadius) suck the cell sap from leaf, flower, and pods. This leads to curling of leaf margin downwards, stunted the growth of the plant and ultimately reduce the yield. Jassid and white fly are also responsible to transmit phyllody and leaf curl diseases in sesame, respectively. Keeping these facts in view, present study on incidence of *Antigastra*, jassid, mirid bug and white fly was undertaken and seasonal incidence of insect pests was estimated under natural condition at AICRP (sesame) centre of College of Agriculture, JNKVV, Tikamgarh (M.P.).

MATERIAL AND METHODS

The experiment was conducted during two consecutive *kharif* seasons of 2013 and 2014. The periodical observations on the incidence of insect pests were recorded in the variety JT-7 at each meteorological week from 15 days after germination to harvest on 200 m² plot without any insecticidal treatment. The variety was sown in first fortnight of July during each season with spacing of 30 cm between rows and 10 cm between plants and other recommended agronomic practices. Observations on the *Antigastra* larvae population were recorded on randomly selected 10 plants from 10 spots of plot and mean pest population was computed per plant. Incidence of nymph and adult of sucking pests (jassid, mirid bug and white fly) were recorded on three leaves from upper canopy of randomly selected 10 plants from 10 spots of plot and mean pest population was computed per plant. In addition, a simple correlation was worked out between the pooled pest population (% incidence) and weather parameters (temperature, relative humidity and rainfall).

RESULTS AND DISCUSSION

Pooled data of weather parameters and incidence of major insect pest of sesame during *kharif* 2013 and 2014 presented in Table 1 and indicated that incidence of *Antigastra* was observed from 31st standard meteorological week (SMW) and continued up to 38th SMW. The highest incidence (0.45 larvae / plant) of *Antigastra* was recorded in 38th SMW. The incidence of *Antigastra* larvae was high when the maximum and minimum temperatures were high and the rainfall was low (Anonymous, 1989). Incidence of all three sucking pests jassid, whitefly and mired bug were at peak during 38th, 36th and 37th SMW (0.59 jassid, 0.79 white fly and 0.77 mirid bug / plant) respectively. Correlation study revealed that *Antigastra* larvae and three sucking pests jassid, white fly and mirid bug population with abiotic factors *viz.* minimum, maximum temperature, relative humidity and rainfall is given in Table 2. There was a significant and negative correlation between *Antigastra* larval population and relative humidity was observed these results are in confirmatory with [1] [6] and .[7] Whereas, incidence of jassid and mirid bug population had significant and positive correlation with maximum temperate and negative correlation with relative humidity and rainfall while mirid bug population had also significant and positive correlation with maximum, minimum temperate but negatively correlated with relative humidity and rainfall.

Table 1: Mean weather parameters and incidence of major insect pest of sesame during *kharif* 2013 and 2014

SMW	Temperature (°C)		RH (%)	Rainfall (mm)	<i>Antigastra</i> Larvae/plant	Population of sucking insects		
	Maximum	Minimum				Jassid adult/plant	Whitefly adult/plant	Mirid bug adult/plant
31	29	24	97	111	0.03	0.29	0.33	0.29
32	28	24	96	163	0.06	0.16	0.50	0.29
33	30	25	94	35	0.06	0.27	0.38	0.59
34	30	23	94	103	0.04	0.18	0.58	0.54
35	32	24	94	57	0.08	0.34	0.50	0.66
36	32	24	95	21	0.13	0.50	0.79	0.63
37	32	23	88	2	0.12	0.33	0.35	0.77
38	33	23	90	0	0.50	0.59	0.63	0.70

Table 2 : Correlation of insect pests population of sesame with meteorological factors.

Insect pests	Temperature (°C)		Relative humidity (%)	Rainfall
	Maximum	Minimum		
<i>Antigastra</i>	0.48	0.25	-0.71*	-0.56
Jassid	0.80*	0.50	-0.81*	-0.77*
Whitfly	0.56	0.11	-0.53	-0.20
Mirid bug	0.72*	0.74*	-0.70*	-0.90*

*Significant at 5% level

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