Short Comminucation

Seasonal incidence of sucking insect pests of Bt cotton in relation to different weather parameters

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Gujarat is one of most important Bt cotton growing state in India having 29.62 lakh ha area with a production of 120 lakh bales and productivity of 689 kg ha⁻¹ lint. In Gujarat, the major cotton producing districts, *viz;* Rajkot, Bhavnagar, Vadodara, Amreli, Mehsana, Bharuch and Surendranagar, produce about 85 per cent of the total cotton production in the state. Rajkot district has the largest area under the cotton (3.65 lakh ha) with the production of 18.10 lakh bales and productivity of 843 kg ha⁻¹ lint during year 2011-12 in Gujarat (Kabaria *et al.*, 2013).

The study was conducted on pest surveillance in Bt cotton on farmers field during year 2009-12. Five talukas of the Rajkot district were selected on the basis of the cotton growing area and four villages per talukas were selected i.e. total twenty villages were selected and two farmers' field per village were selected and data recorded weekly on every Monday and Tuesday in morning between 6:30-8:30 am. The data recorded from 4th week of July to 4th week of Dec. Two fields per village were selected in opposite direction to get the picture of entire village. For getting the information of pest status of entire village common growing variety of the Bt cotton in the village was selected for study. Every year two new farmers field were selected and some of the old villages were replaced by new villages of the same taluka. So far total 36 villages were covered from year 2009-12. Ten field scouts were recruited and trained to collect the data and each field scouts were given two villages. The data was collected from 20 randomly selected plants/field. Farmers' methods of plant protections and agronomic practices were followed. The data of jassid (nymphs), *Amarsca biguttula biguttula* (Ishida); whitefly (adults), *Bemisia tabaci* (Gennadius)*;* and thrips , *Thrips tabaci* Lindeman were recorded from three randomly selected leaves from top, middle and bottom per plant. The aphid, *Aphis gossypii* Glover incidence was calculated in per cent infested plants by observing the aphids on terminal shoots. Mealy bug,

Phenococcous solenopsis was recorded in grade system i.e. 0-4 grade where 0 for no mealy bug population, 1 for scattered mealy bug appearance, 2 for full infestation on any one branch of plant, 3 for full infestation on more than one branch/half portion of the plant and 4 for heavy infestation on whole plant. The mean sucking pest population of four years was worked out and data were analysed statistically for correlation study with weather parameters such as maximum and minimum temperature, morning and evening relative humidity and rainfall.

Aphid

Aphid incidence (Fig. 1) started from 4th week of July and found throughout the year however its peak period (27.2 %) was observed during 3rd week of Dec. Aphid incidence showed (Table 1) significantly negative correlation with minimum temperature, relative humidity and rainfall. Prasad *et al.* (2008) observed the significant negative association with minimum temperature, relative humidity at morning and evening and rainfall.

Jassid

The average data (Fig. 2) of four years shows that the pest appeared from 4th week of July and increased gradually and reached its peak on 4th week of Sept 3.50/3 leaves and than pest population decreased in the subsequent weeks. Jassid population showed (Table 1) significantly negative correlation with relative humidity. Sitaramraju *et al.* (2010) observed the significant negative correlation with morning and evening relative humidity.
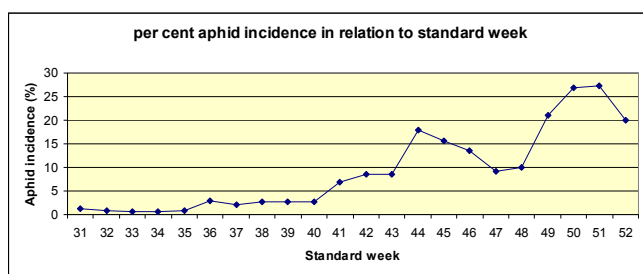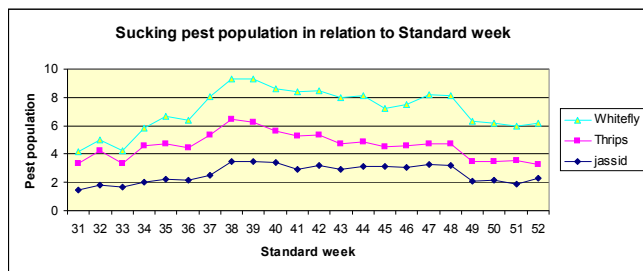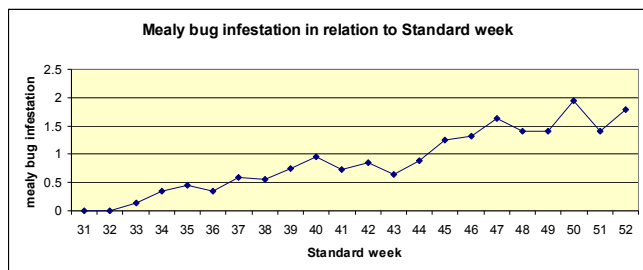
Thrips

The average data (Fig. 2) of four years indicate that the pest appeared from 4th week of July and reached its peak 2.94/3 leaves on 3rd week of Sept and then decreased in subsequent weeks. Thrips population showed (Table 1) significantly positive correlation with maximum and minimum

Table 1: Correlation analysis of sucking insect pests and weather parameter

Sr. no.	Name of sucking pest	Temperature (°C)		Relative humidity (%)		Rainfall (mm)
		Maximum	minimum	Morning	Evening	
1	Aphid	0.162	-0.886**	-0.849**	-0.809**	-0.509*
2	Jassid	-0.009	0.005	-0.472*	-0.532*	-0.219
3	Thrips	0.753**	0.811**	0.088	-0.062	-0.490*
4	Whitefly	0.157	-0.498*	-0.599**	-0.718**	-0.399
5	Mealy bug	0.477*	-0.926**	-0.820**	-0.773**	-0.523*

*Significant at 0.05 level (r= 0.468)

** Significant at 0.01 level (r= 0.590)

Fig. 1: Per cent aphid incidence in relation to meteorological standard week

Fig. 2: Jassid, thrips and whitefly population in relation to meteorological standard week

Fig. 3: Mealy bug infestation in relation to meteorological standard week

temperature, whereas correlation with rainfall was significant negative. Shivana *et al.* (2009) observed positive correlation of the maximum temperature with population of cotton thrips.

Whitefly

The average data (Fig. 2) of four years indicates that the pest appeared from 4th week of July and reached its peak 3.48/3 leaves on 3rd week of Nov. Whitefly population showed (Table 1) significantly negative correlation with minimum temperature and relative humidity at morning and evening. Rakesh kumar *et al.* (2010) reported that population of cotton whitefly negatively correlated with minimum temperature, relative humidity.

Mealy bug

The average data (Fig. 3) of four years shows that the pest appeared from 2nd week of August and reached its peak 1.95 grade on 2nd week of Dec. Mealy bug infestation found (Table 1) positive correlation with maximum temperature and negative correlation with minimum temperature and relative humidity at morning and evening and rainfall. Hanchnal et al. (2010) recorded significant positive correlation of mealy bug population with maximum temperature and negatively correlated with other parameters which support the present investigation.

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