



Seasonal incidence of spiralling whitefly, *A. disperses* in Konkan region

S. S. Morde*, S. K. Godase, M. S. Masal

Department of Agriculture Entomology, College of Agriculture Dapoli,
Dist. Ratnagiri 415712 Maharashtra

ABSTRACT

The experiment was conducted on some guava plants during 2013-2014 in college of Agriculture, Dapoli Dist. Ratnagiri, Maharashtra state. Incidence of spiralling whitefly occurred throughout the year except 44th meteorological week. However, the peak period was noticed from first week of March to last week May. The correlation study with weather parameters showed significant positive correlation with maximum temperature and significant negative correlation with relative humidity (morning and afternoon) and rainfall.

Keywords: spiralling whitefly, *Aleurodicus disperses* Russell, guava, seasonal incidence

Received 11.07.2017

Revised 02.08.2017

Accepted 20.08.2017

INTRODUCTION

Guava is fourth most widely grown fruit crop in India. The area under guava is about 2.2 lakh hectares with production 27.10 lakh tonnes (Anonymous, 2012). Guava is infested by many insect pests, of which Spiralling white fly, *Aleurodicus disperses* (Russell) has become a serious pest in recent years. Both adults and nymphs suck the sap from lower surface of leaves and secrete honey dew which favours sooty mould development and thereby inhibits photosynthetic activity (Douressamy *et al.*, 2002). As the information on spiralling whitefly and its management is not present in Konkan region of Maharashtra, the present research work has been aimed to find out seasonal incidence of this pest

MATERIAL AND METHODS

To study the seasonal incidence of whitefly population, five guava trees were selected, which did not receive insecticidal spray throughout the experimental period. For recording the observations, five leaves/plant were selected randomly and weekly observations on adult population were recorded from 01-04-2013 to 31-03-2014 on the incidence of adults of spiralling whitefly. Then, the data on weekly average population of whitefly was correlated with weather parameters *viz.*, maximum and minimum temperature, relative humidity (morning and afternoon), wind velocity and weekly total rainfall. The weather data was collected from meteorological observatory of College of Agriculture, Dapoli were used for correlation studies.

RESULT AND DISCUSSION

Population of spiralling whitefly was noticed throughout the period except 44th meteorological week however, the outbreak was noticed from 9th meteorological week coinciding with first week of March to the 21st meteorological week (Last week of May), which was in the range of 14.6 to 34.8 adults/ five leaves (Table 1).

The initial population was 24.2 adults/five leaves during 14th meteorological week (fourth week of March), which reached to its peak with 34.8 adults/five leaves during 18th meteorological week, remained more or less stable till 20th meteorological week. Then suddenly drop to 18.2 adults/five leaves and remained more or less stable till 23rd meteorological week. Further declined suddenly and remained at low level (less than 5 adults/five leaves) from 24th meteorological week to 8th meteorological week, however in between these period, the slight rise in population in the range of 6.4 to 14.2 adults per five leaves noticed during 34th to 36th meteorological week. Again there was sudden rise in population noticed

from 9th meteorological week with 14.6 adults/ five leaves, which gradually rise to 24.8/five leaves during 13th meteorological week.

Looking to the overall seasonal population fluctuation, the population of spiralling whitefly was relatively low during 24th meteorological week approximately corresponding to the second week of June, 2013 to 8th meteorological week corresponding to third week of February, 2014 and maximum during 9th meteorological week approximately corresponding to the third week of February to the 23rd meteorological week corresponding to the last week of May and first week of June, indicating peak activities during dry months. To study the weather relation, the coefficient of correlation (r) between the seasonal population of spiralling whitefly and weather parameters were worked out and results are presented in Table 2. The correlation study suggested that the incidence of adult *A. disperses* had significant positive correlation with maximum temperature ($r=0.495$) indicating rise in population with rise in maximum temperature. On the contrary, relative humidity [morning ($r=-0.637$) and afternoon ($r=-0.298$)] had significant but negative correlation with adult population indicating rise in population with decrease in relative humidity (morning and afternoon). Similarly, rainfall ($r=-0.304$) had also significant but negative correlation with adult population.

The present results indicated that the spiralling whitefly was found throughout the year on the guava. This is an agreement with a report of Wen *et al.* (1995), who observed the incidence of *A. disperses* throughout the year in Southern Hawaii. During present study the peak activity was noticed during dry months i.e. March to May. Similarly, Banjo and Tatunde (1999) also observed the peak activity during dry months. Mani and Krishnamoorthi (2000) also reported peak activity from March to June, which is in close agreement with the present finding. More or less similar trend in pest incidence was also recorded earlier by Singh *et al.* (2005); Baskaran *et al.* (2004) and Aishwariya *et al.* (2007). The positive correlation with temperature and significant negative correlation with relative humidity and rainfall was earlier reported by Mallappanavar (2000), also confirmed the present finding.

REFERENCES

1. Aishwariya, K. K.; M. Manjunatha, and M. (2007). Seasonal incidence of spiraling whitefly *Aleurodicus dispersus* (Russell) and its natural enemies in relation to weather in Shimoga. *Karnataka J. Agric. Sci.*, **20(1)**: 146-148.
2. Anonymous, (2012). Indian Horticulture Database (www.nhb.gov.in).
3. Banjo, A. D. and Tatunde-Dada II. (1999). An assessment of host plant preference of the spiraling whitefly (*Aleurodicus dispersus*) in Ago-Iwoye, Nigeria. *Crop Res.*; **17(3)**, 390-4.
4. Baskaran, V.; D. J. Reddy; G. V. Subbaratnam; S. Amarender reddy and Narendra Nath (2004). Effect of weather factors on spiralling whitefly population on Guava. *Pestology*; **28(7)**, 21-3.
5. Douressamy, S.; K. Senguttuvan; N. Chandramohan and A. Subramanian, (2002). Biology of spiraling whitefly, *Aleurodicus dispersus* Russell on tapioca and guava. *J. of Applied Zoological research*; **13(2/3)**; 212-213.
6. Mallappanavar, M. C. (2000). Bioecology and management of spiralling whitefly *Aleurodicus dispersus* Russell by *Verticillium lecanii* (Zimm.) on guava. *M.Sc. (Agri.) thesis*, University of Agricultural Sciences, Dharwad, India.
7. Mani, M. and A. A. Krishnamoorthy (2000). Population dynamics of spiralling whitefly, *Aleurodicus dispersus* Russell (Aleyrodidae, Homoptera) and its natural enemies on guava in India; *Entomon*, **25(1)**, 29-34.
8. Singh, R. N.; M. Maheshwari and B. Saratchandra (2005). Biocenology and control of whiteflies in sericulture. *Insect Sci.*; **12(6)**; 401-412.
9. Wen, H. C., T. C. Hsu and C. N. Chen (1995). Yield loss and control of spiralling whitefly *Aleurodicus dispersus*. *J. Agric. Res. China*, **44**; 147-156

Table 1. Seasonal incidence of spiraling whitefly *Aleurodicus disperses* Russell at College of Agriculture, Dapoli, Dist. Ratnagiri (Maharashtra state) during April 2013 to March 2014

Period	SMW	Mean number of adults /5 leaves	Temperature (°C)		Relative humidity (%)		Wind velocity (Km/hr.)	Rainfall (mm)
			Maximum	Minimum	Morning	Afternoon		
26.03.13- 01.04.13	14	24.2	31.69	17.79	91.00	70.57	5.83	0.00
02.04.13 - 08.04.13	15	28.6	32.34	17.70	89.57	75.43	5.33	0.00
09.04.13 - 15.04.13	16	29.8	33.06	19.71	87.29	67.71	6.09	0.00
16.04.13 - 22.04.13	17	26.8	30.86	19.01	80.86	60.86	5.39	0.00
23.04.13 - 29.04.13	18	34.8	33.00	22.27	86.57	62.86	6.20	0.00
30.04.13 - 06.05.13	19	29.2	33.84	21.83	82.00	56.57	6.33	0.00
07.05.13 - 13.05.13	20	32.2	33.14	20.69	80.00	64.71	6.60	0.00
14.05.13- 20.05.13	21	18.2	32.54	24.27	90.71	74.71	6.36	0.00
21.05.13 - 27.05.13	22	14.0	33.30	24.80	88.43	78.29	6.51	0.00
28.05.13 - 03.06.13	23	16.0	33.63	24.34	90.43	84.43	7.99	60.90
04.06.13 - 10.06.13	24	3.4	30.31	24.06	95.43	97.57	6.03	471.80
11.06.13 - 17.06.13	25	4.2	28.01	23.94	94.71	93.86	10.90	769.20
18.06.13 - 24.06.13	26	3.0	28.10	23.51	93.57	95.14	6.39	250.20

25.06.13 - 01.07.13	27	1.8	28.19	23.91	94.29	92.29	10.00	213.20
02.07.13 - 08.07.13	28	2.2	27.57	24.21	93.86	93.57	9.19	305.80
09.07.13 - 15.07.13	29	2.2	26.56	23.19	96.57	94.71	8.83	498.90
16.07.13 - 22.07.13	30	1.2	26.43	23.27	96.57	92.86	9.66	495.80
23.07.13 - 29.07.13	31	1.8	26.54	23.30	95.71	93.00	11.00	388.40
30.07.13 - 05.08.13	32	1.6	27.11	23.67	94.86	92.00	11.83	253.40
06.08.13 - 12.08.13	33	1.2	28.07	23.93	91.86	85.29	8.44	98.00
13.08.13 - 19.08.13	34	7.4	27.76	24.03	96.29	87.43	7.94	138.40
20.08.13 - 26.08.13	35	14.2	28.29	23.81	90.86	86.86	7.29	106.40
27.08.13 - 02.09.13	36	6.4	28.70	22.91	93.14	85.86	4.10	41.20
03.09.13 - 09.09.13	37	3.0	29.39	23.10	91.43	87.29	3.77	18.40
10.09.13 - 16.09.13	38	2.2	29.90	23.19	93.57	87.71	4.06	71.40
17.09.13 - 23.09.13	39	2.2	28.17	23.66	94.14	92.29	3.80	78.00
Period	SMW	Mean number of adults /5 leaves	Temperature (°C)		Relative humidity (%)		Wind velocity (km/hour)	Rainfall (mm)
			Maximum	Minimum	Morning	Afternoon		
24.09.13 - 30.09.13	40	1.0	28.07	22.99	95.86	89.86	5.17	113.60
01.10.13 - 07.10.13	41	1.4	28.86	23.43	94.57	84.86	4.16	306.40
08.10.13 - 14.10.13	42	1.6	29.81	22.37	91.43	84.29	3.47	39.80
15.10.13 - 21.10.13	43	0.0	32.33	23.39	89.86	74.14	2.79	8.80
22.10.13 - 28.10.13	44	0.2	32.93	22.70	90.57	75.86	3.39	10.40
29.10.13 - 04.11.13	45	1.2	32.34	21.46	90.57	66.00	3.07	0.00
05.11.13 - 11.11.13	46	1.0	32.61	19.64	94.86	57.71	2.67	0.00
12.11.13 - 18.11.13	47	0.8	31.64	16.36	89.86	47.43	2.86	0.00
19.11.13 - 25.11.13	48	3.8	33.20	16.07	92.29	52.14	2.61	0.00
26.11.13 - 02.12.13	49	3.6	32.81	19.89	91.29	61.14	2.36	0.00
03.12.13 - 09.12.13	50	1.2	32.17	17.07	90.00	62.00	2.73	9.60
10.12.13 - 16.12.13	51	0.4	31.77	10.99	86.00	51.29	2.84	0.00
17.12.13 - 23.12.13	52	5.0	30.93	10.91	89.00	71.00	2.27	0.00
24.12.13 - 31.12.13	01	1.2	30.88	15.63	90.38	66.25	3.38	0.00
01.01.14 - 07.01.14	02	3.6	30.26	14.61	92.43	67.71	3.04	0.00
08.01.14 - 14.01.14	03	3.4	29.34	13.11	94.29	56.71	3.17	0.00
15.01.14 - 21.01.14	04	0.6	28.89	13.60	90.14	63.00	2.89	0.00
22.01.14 - 28.01.14	05	1.4	31.04	16.80	90.71	63.29	3.43	0.00
29.01.14 - 04.02.14	06	4.8	32.31	14.56	89.57	63.57	3.14	0.00
05.02.14 - 11.02.14	07	1.8	31.41	12.61	88.29	64.43	3.57	0.00
12.02.14 - 18.02.14	08	4.8	28.10	13.07	87.71	56.57	4.40	0.00
19.02.14 - 25.02.14	09	14.6	30.81	16.16	89.14	60.71	4.21	0.00
26.02.14 - 04.03.14	10	19.2	30.00	15.29	92.00	67.14	4.64	0.00
05.03.14 - 11.03.14	11	19.8	29.53	15.10	90.14	59.57	3.90	0.00
26.03.13 - 01.04.13	12	23.2	34.57	18.76	90.57	57.86	4.03	0.00
02.04.13 - 08.04.13	13	24.8	33.73	17.39	85.38	61.25	4.61	0.00

SMW- Standard Meteorological Week

Table 2. Correlation coefficients between weather parameters and adult population of spiralling whitefly on guava

Weather parameter		Average Whitefly population/5 leaves
Temperature	Maximum Temp. (°C)	0.495*
	Minimum Temp. (°C)	-0.020
Relative Humidity	RH morning (%)	-0.637*
	RH afternoon (%)	-0.298*
Wind speed (km/hours)		0.111
Rainfall (mm)		-0.304*
R ² value		0.592

N=52

*Significant at 5%

Table 'r' value = 0.273 (N=16)

CITATION OF THIS ARTICLE

S. S. Morde, S. K. Godase, M. S. Masal. Seasonal incidence of spiralling whitefly, *A. disperses* in Konkan region. Bull. Env. Pharmacol. Life Sci., Vol 6 Special issue 2, 2017: 154-156