Int.J.Curr.Microbiol.App.Sci (2017) *6*(9): 2661-2669

International Journal of Current Microbiology and Applied Sciences
ISSN: 2319-7706 **Volume 6 Number 9 (2017) pp. 2661-2669**
Journal homepage: http://www.ijcmas.com

Original Research Article https://doi.org/10.20546/ijcmas.2017.609.328

Seasonal Incidence of Spider Mite (*Tetranychus urticae* Koch) (Acari: Tetranychidae) Infesting Rose under Poly House Condition

S.R. Desai*, K.G. Patel and Abhishek Shukla

Department of Agricultural Entomology, N. M. College of Agriculture, Navsari Agricultural University, Navsari 396 450, Gujarat, India
**Corresponding author*

Keywords

Seasonal incidence, Spider mite, Rose, *Tetranychus urticae*

Article Info

Accepted:
26 August 2017
Available Online:
10 September 2017

A B S T R A C T

Study on seasonal incidence on spider mite (*Tetranychus urticae* Koch) infesting rose under poly house condition were carried out at Navsari Agricultural University, Navsari, Gujarat during 2015-2016. Under the present study the two spotted spider mite (*T. urticae*) was recorded on rose (cv. Top secret) grown under the poly house condition. Seasonal incidence of *T. urticae* revealed that, the spider mite population observed from 3rd week of July to 1st week of August. It was highly significant correlation with minimum temperature and average temperature, while negative non-significant correlation with average relative humidity and maximum temperature.

Introduction

Flower, the most beautiful and fascinating part of nature, have power to overwhelm anybody's heart with love, happiness and joy. The area under floricultural crops in India is 2,42,710 hectares with production of 15,45,250 Metric tonnes. As far as Gujarat state is concerned the area under flower production is 19,670 ha. India produced 6,91,190 Metric tonnes cut flowers during the year 2016. (Anonymous, 2016). Rose has been the world's most favorite and unchallenged flower and reigned supreme as the "Queen of flowers". A title bestowed on it by the Greek poetess "Sappho" and none has since questioned its right to the title. Rose plant is attacked by number of insect pests like bud borers, thrips, scales, aphids, weevils, chafer beetles, leaf eating caterpillars and non-insect pest like red spider mite. Among the non-insect pests the two spotted red spider mite, *Tetranychus urticae* Koch (Acari: Tetranychidae) is the most important one causing serious damage to rose and other crops grown in poly house as well as in open field.

Today, it poses greatest threat to poly house roses. They usually colonize on under surface of leaves and when population is very high, they can effect on all parts of the plant including flowers. They prefer nitrogen rich young leaves, but in well-established colonies

older leaves become heavily infected. As, the population build up, spider mites usually spine sufficient webbing to cover the entire plant. The spider mite pierces the epidermis cells of the host plant with its stylet like mouthparts known as cheliceri. To develop effective management strategies against any pest it is very important to understand its seasonal activities, therefore an experiment was undertaken to investigate the seasonal activities of *T. urticae* on poly house rose.

Materials and Methods

The study on seasonal incidence of spider mite, *T. urticae* infesting rose were carried out during the 2015 to 2016) at poly house, Department of Floriculture and Landscaping, ASPEE College of Horticulture and Forestry, N. A. U., Navsari. The observations on the incidence of spider mite were recorded at weekly interval, beginning from January 2015 and continued up to December 2016 on rose cv. Top secret. For sampling, three random leaves representing top, middle and bottom canopy were plucked from each of twenty five randomly selected plants per bed.

These leaves were held in separate properly labeled polyethylene bags and brought to the laboratory for numerical mite counts (live) from whole leaf under stereobinocular microscope. The data were recorded separately considering canopy and leaf surface for different standing rose plants. The observation on spider mite counts were recorded for two years in case of each standing rose plants under poly house condition. The data thus obtained were summed up and converted to total population per leaf (irrespective of plant canopy and leaf surface). To understand the pattern of distribution of spider mites on the plant and their preference to leaf surface, the data recorded on spider mite counts were summed up separately considering plant canopy.

Results and Discussion

The data recorded on the seasonal incidence of spider mite, *T. urticae* were presented and discussed yearwise as well as pooled over of two years.

Year 2015

It is evident from table 1 that the population of spider mite *T. urticae* remains active throughout the year under poly house condition. The mean mite population during 1st standard meteorological week (SMW) *i.e.* first week of January was 0.07 mites per leaf. The average temperature and relative humidity of poly house during this period were 22.27^{o}C and 59.52 per cent, respectively. The spider mite population on rose cv. top secret under poly house remains active round the year and gradually increased during various months of year. It increased at faster rate and reached to its peak during the 31st SMW *i.e.* first week of August 2015 with 11.99 spider mites per leaf. The average temperature and relative humidity of poly house during this period were 29.65^{o}C and 63.70 per cent, respectively. The spider mite population then it has started declining in the later weeks of the year.The average population of spider mite, *T. urticae* was 5.11 per leaf. The distribution of spider mite, *T. urticae* on rose grown under poly house condition was also presented in table 1. Throughout the crop season the population of *T. urticae* remains higher on the top leaves (9.77 mites per leaf), followed by middle leaves (4.22 mites per leaf) and lowest population were recorded on bottom leaf canopy (1.34 mites per leaf).

The correlation between *T. urticae* and abiotic factors like maximum temperature, minimum temperature, average temperature and average relative humidity of poly house were also worked out. It is clearly seen from table 3 that

there were a highly significant positive correlation between population of *T. urticae* with maximum temperature (r=0.379), minimum temperature (r=0.560) and average temperature (r= 0.512). The average relative humidity at the time of observation had a non-significant negative correlation (r=-0.060) with spider mite population.

Year 2016

It is evident from table 1 that the population of spider mite *T. urticae* remains active round the year under poly house condition. The mean mite population during 1st standard meteorological week (SMW) i.e. first week of January was 0.33 mite per leaf. The average temperature and relative humidity of poly house during this period were 24.06°C and 69.85 per cent, respectively.

The spider mite population under poly house remains active round the year and gradually increased during various months of year. It increased at faster rate and reached to its peak during the 29th SMW i.e. third week of July 2016 with 12.47 spider mites per leaf. The average temperature and relative humidity was 32.80°C and 84.78 per cent, respectively. Then the spider mite population has started declining in the later weeks of the year.The average population of the *T. urticae* was 5.27 mites per leaf. The distribution of *T. urticae* on rose grown under poly house condition was also presented in table 1.

Throughout the crop season the population of spider mite *T. urticae* remains higher on the top leaves (10.37 mites per leaf), followed by middle leaves (4.16 per mites leaf) and lowest population were recorded on bottom leaf canopy (1.27 mites per leaf).

The correlation between spider mite *T. urticae* and abiotic factors of poly house *viz.*, maximum temperature, minimum temperature, average temperature and average relative humidity of poly house were also worked out. It is clearly seen from table 3 that there were a highly significant positive correlation between population of spider mite *T. urticae* with minimum temperature (r=0.866), average temperature (r=0.647) and average relative humidity (r= 0.740). The maximum temperature had also a significant positive correlation (r= 0.278) with spider mite *T. urticae* population on rose.

Pooled

It is evident from table 2 that the population of spider mite *T. urticae* remains active round the year under poly house condition. The mean mite population during 1st standard meteorological week (SMW) *i.e.* first week of January was 0.20 mite per leaf. The average temperature and relative humidity of poly house during this period were 23.16°C and 64.69 per cent, respectively.

The spider mite population under poly house remains active round the year and gradually increased during various months of year. It increased at faster rate and reached to its peak during the 29th SMW with 11.77 spider mites per leaf. The average temperature and relative humidity was 31.78°C and 72.04 per cent, respectively.

Then the spider mite population has started declining in the later weeks of the year. The average population of the *T. urticae* was 5.19 mites per leaf. The distribution of *T. urticae* on rose grown under poly house condition was also presented in table 2.

Throughout the crop season the population of spider mite *T. urticae* remains higher on the top leaves (10.07 mites per leaf), followed by middle leaves (4.19 per mites leaf) and lowest population were recorded on bottom leaf canopy (1.31 mites per leaf).

Table.1 Seasonal incidence of spider mite, *Tetranychus urticae* on rose (cv. Top secret) under poly house condition

SMW	Mean number of spider mite per leaf								Temperature (^{o} C)						Average RH%	
	Year 2015				Year 2016				Year 2015			Year 2016			Year 2015	Year 2016
	Top	Middle	Bottom	Average	Top	Middle	Bottom	Average	Max.	Min.	Ave.	Max.	Min.	Ave.		
1	0.20	0.00	0.00	**0.07**	0.80	0.20	0.00	**0.33**	30.33	14.20	22.27	33.91	14.20	24.06	59.52	69.85
2	0.80	0.20	0.00	**0.33**	1.20	0.60	0.00	**0.60**	32.34	15.40	23.87	32.70	11.69	22.19	62.57	63.70
3	1.00	0.64	0.12	**0.59**	1.40	1.00	0.00	**0.80**	31.04	13.70	22.37	28.93	10.47	19.70	66.54	53.95
4	1.12	0.80	0.20	**0.71**	1.84	1.24	0.40	**1.16**	29.41	15.00	22.21	30.89	12.70	21.79	71.82	65.00
5	1.48	1.12	0.28	**0.96**	2.20	1.48	0.60	**1.43**	31.24	20.60	25.92	32.61	15.00	23.81	71.90	65.75
6	1.80	1.24	0.40	**1.15**	2.44	1.80	0.40	**1.55**	33.37	18.10	25.74	31.09	13.50	22.29	82.01	55.45
7	2.12	1.60	0.48	**1.40**	2.40	2.00	0.80	**1.73**	33.83	19.90	26.86	30.27	13.20	21.74	84.08	56.50
8	2.40	1.84	0.60	**1.61**	2.60	2.12	0.92	**1.88**	32.13	17.80	24.97	33.44	15.10	24.27	83.54	62.90
9	2.64	2.00	0.72	**1.79**	2.68	1.92	1.00	**1.87**	32.02	18.90	25.46	35.09	17.80	26.44	81.70	68.55
10	2.84	2.12	0.80	**1.92**	2.80	2.20	0.80	**1.93**	34.11	21.60	27.86	34.69	16.64	25.66	67.10	70.95
11	3.00	2.40	0.84	**2.08**	3.00	2.60	0.80	**2.13**	33.91	23.80	28.86	34.30	17.61	25.96	66.60	82.35
12	3.40	2.68	0.80	**2.29**	3.20	2.60	0.88	**2.23**	34.54	27.00	30.77	37.13	18.17	27.65	64.05	85.20
13	3.88	2.80	0.92	**2.53**	3.48	2.84	1.00	**2.44**	36.69	24.60	30.64	38.83	18.76	28.79	59.45	83.15
14	4.32	2.92	1.00	**2.75**	3.80	3.00	1.12	**2.64**	37.50	25.60	31.55	35.61	20.67	28.14	57.59	62.00
15	4.60	3.00	1.08	**2.89**	4.20	3.16	1.20	**2.85**	35.90	26.30	31.10	37.61	20.23	28.92	56.40	62.50
16	5.00	3.20	1.20	**3.13**	5.60	3.20	1.20	**3.33**	38.11	29.60	33.86	37.33	22.06	29.69	51.00	55.55
17	5.80	3.36	1.16	**3.44**	6.00	3.60	1.40	**3.67**	38.80	31.20	35.00	34.60	22.04	28.32	51.60	56.44
18	7.00	3.48	1.40	**3.96**	8.20	4.20	1.52	**4.64**	40.10	29.40	34.75	40.70	23.26	31.98	48.85	68.88
19	8.20	3.64	1.60	**4.48**	10.40	4.00	1.60	**5.33**	37.83	28.30	33.06	38.40	26.00	32.20	46.31	72.11
20	9.00	3.92	1.80	**4.91**	11.24	4.12	1.80	**5.72**	40.60	31.80	36.20	40.90	28.60	34.75	48.56	69.75
21	11.24	4.20	1.92	**5.79**	13.12	5.00	1.80	**6.64**	43.90	32.20	38.05	44.30	30.90	37.60	46.65	69.47
22	14.40	4.60	2.00	**7.00**	15.60	5.40	1.92	**7.64**	44.50	33.70	39.10	46.40	27.26	36.83	50.46	65.97
23	15.60	5.00	2.24	**7.61**	16.80	6.00	2.00	**8.27**	44.20	34.60	39.40	45.50	30.00	37.75	52.15	79.30
24	17.00	6.12	2.40	**8.51**	18.24	7.12	2.20	**9.19**	44.90	33.80	39.35	44.30	27.54	35.92	45.85	74.63

25	18.80	7.00	2.60	**9.47**	19.80	9.00	2.44	**10.41**	43.50	32.20	37.85	44.50	31.90	38.20	51.70	71.91
26	19.60	7.80	2.84	**10.08**	21.00	9.60	2.80	**11.13**	41.70	29.30	35.50	43.00	30.20	36.60	49.40	84.41
27	20.48	8.20	2.92	**10.53**	23.40	8.80	2.80	**11.67**	40.30	26.61	33.46	41.90	31.70	36.80	52.16	88.36
28	21.00	8.48	3.12	**10.87**	24.28	9.00	2.64	**11.97**	38.60	26.14	32.37	39.00	29.40	34.20	56.06	86.22
29	21.60	8.60	3.00	**11.07**	25.60	9.20	2.60	**12.47**	36.30	25.23	30.76	36.70	28.90	32.80	59.30	84.78
30	22.40	9.00	3.00	**11.47**	23.00	8.60	2.60	**11.40**	34.80	23.60	29.20	33.00	26.50	29.75	59.60	88.22
31	23.60	9.40	2.96	**11.99**	21.80	8.12	2.40	**10.77**	35.50	23.80	29.65	30.90	25.50	28.20	63.70	91.57
32	21.40	9.20	2.88	**11.16**	20.12	7.60	2.52	**10.08**	34.20	24.34	29.27	29.99	23.66	26.82	63.10	90.11
33	20.00	8.20	2.60	**10.27**	18.92	6.80	2.20	**9.31**	31.69	24.50	28.09	30.97	24.66	27.81	62.23	82.89
34	19.48	7.80	2.40	**9.89**	18.20	6.64	2.00	**8.95**	32.26	24.56	28.41	30.67	24.17	27.42	65.06	82.27
35	18.00	7.40	2.16	**9.19**	17.80	7.00	2.00	**8.93**	32.76	23.76	28.26	31.17	24.01	27.59	70.58	81.12
36	17.20	7.00	2.00	**8.73**	19.00	6.80	1.80	**9.20**	33.83	22.41	28.12	30.91	23.09	27.00	74.14	79.72
37	16.60	6.76	1.84	**8.40**	18.12	6.20	1.64	**8.65**	32.64	22.69	27.66	31.07	22.76	26.91	85.93	81.87
38	15.12	6.80	1.80	**7.91**	17.00	5.52	1.48	**8.00**	29.91	23.21	26.56	29.53	22.79	26.16	83.84	92.32
39	14.84	6.68	1.60	**7.71**	16.52	5.16	1.40	**7.69**	33.36	21.87	27.61	31.91	22.33	27.12	75.24	83.92
40	14.20	6.20	1.60	**7.33**	15.12	4.60	1.28	**7.00**	36.51	23.80	30.16	30.59	23.10	26.84	71.17	88.49
41	13.00	5.80	1.36	**6.72**	13.60	4.00	1.20	**6.27**	36.10	23.26	29.68	31.19	21.90	26.54	76.41	83.22
42	11.60	5.16	1.20	**5.99**	12.00	3.48	1.00	**5.49**	38.93	21.76	30.34	34.33	19.06	26.69	61.13	69.00
43	10.40	5.00	1.08	**5.49**	10.80	3.60	0.92	**5.11**	36.90	21.37	29.14	33.86	17.47	25.66	66.26	59.96
44	9.44	4.60	0.92	**4.99**	10.00	3.40	0.80	**4.73**	35.47	19.93	27.70	32.69	16.43	24.56	61.80	62.10
45	8.40	4.00	0.80	**4.40**	8.60	3.00	0.64	**4.08**	36.29	19.06	27.67	34.26	13.70	23.98	58.87	50.81
46	7.20	3.40	0.60	**3.73**	7.20	2.56	0.48	**3.41**	36.19	19.73	27.96	33.97	15.14	24.56	60.88	52.61
47	5.80	2.00	0.40	**2.73**	5.44	2.12	0.36	**2.64**	34.97	20.81	27.89	33.94	12.57	23.26	60.36	45.52
48	4.00	1.24	0.16	**1.80**	4.60	1.80	0.28	**2.23**	34.69	17.81	26.25	34.49	12.34	23.41	57.91	51.40
49	2.40	0.60	0.08	**1.03**	2.00	1.36	0.20	**1.19**	35.00	14.07	24.54	33.41	14.44	23.93	54.48	49.58
50	1.00	0.36	0.00	**0.45**	1.20	0.80	0.20	**0.73**	31.50	11.47	21.49	32.84	12.49	22.66	59.10	48.45
51	0.80	0.08	0.00	**0.29**	0.80	0.12	0.00	**0.31**	31.13	10.47	20.80	32.86	13.67	23.26	49.15	48.57
52	0.92	0.00	0.00	**0.31**	0.20	0.00	0.00	**0.07**	32.31	11.44	21.88	32.31	11.43	21.87	44.04	48.79
Mean	**9.77**	**4.22**	**1.34**	**5.11**	**10.37**	**4.16**	**1.27**	**5.27**								

SMW = Standard Meteorological Week

Table.2 Seasonal incidence of spider mite, *Tetranychus urticae* on rose (cv. Top secret) under poly house condition (Pooled)

SMW	Mean number of spider mite per leaf				Temperature (° C)			Average
	Top	Middle	Bottom	Average.	Max.	Min.	Ave.	RH%
1	0.50	0.10	0.00	**0.20**	32.12	14.20	23.16	64.69
2	1.00	0.40	0.00	**0.47**	32.52	13.54	23.03	63.13
3	1.20	0.82	0.06	**0.69**	29.99	12.09	21.04	60.24
4	1.48	1.02	0.30	**0.93**	30.15	13.85	22.00	68.41
5	1.84	1.30	0.44	**1.19**	31.93	17.80	24.86	68.83
6	2.12	1.52	0.40	**1.35**	32.23	15.80	24.01	68.73
7	2.26	1.80	0.64	**1.57**	32.05	16.55	24.30	70.29
8	2.50	1.98	0.76	**1.75**	32.79	16.45	24.62	73.22
9	2.66	1.96	0.86	**1.83**	33.55	18.35	25.95	75.13
10	2.82	2.16	0.80	**1.93**	34.40	19.12	26.76	69.03
11	3.00	2.50	0.82	**2.11**	34.11	20.71	27.41	74.48
12	3.30	2.64	0.84	**2.26**	35.84	22.59	29.21	74.63
13	3.68	2.82	0.96	**2.49**	37.76	21.68	29.72	71.30
14	4.06	2.96	1.06	**2.69**	36.56	23.14	29.85	59.80
15	4.40	3.08	1.14	**2.87**	36.76	23.26	30.01	59.45
16	5.30	3.20	1.20	**3.23**	37.72	25.83	31.78	53.28
17	5.90	3.48	1.28	**3.55**	36.70	26.62	31.66	54.02
18	7.60	3.84	1.46	**4.30**	40.40	26.33	33.36	58.87
19	9.30	3.82	1.60	**4.91**	38.11	27.15	32.63	59.21
20	10.12	4.02	1.80	**5.31**	40.75	30.20	35.48	59.16
21	12.18	4.60	1.86	**6.21**	44.10	31.55	37.83	58.06
22	15.00	5.00	1.96	**7.32**	45.45	30.48	37.96	58.21
23	16.20	5.50	2.12	**7.94**	44.85	32.30	38.58	65.73
24	17.62	6.62	2.30	**8.85**	44.60	30.67	37.64	60.24
25	19.30	8.00	2.52	**9.94**	44.00	32.05	38.03	61.81
26	20.30	8.70	2.82	**10.61**	42.35	29.75	36.05	66.90
27	21.94	8.50	2.86	**11.10**	41.10	29.16	35.13	70.26
28	22.64	8.74	2.88	**11.42**	38.80	27.77	33.29	71.14
29	23.60	8.90	2.80	**11.77**	36.50	27.06	31.78	72.04
30	22.70	8.80	2.80	**11.43**	33.90	25.05	29.48	73.91
31	22.70	8.76	2.68	**11.38**	33.20	24.65	28.93	77.63

32	20.76	8.40	2.70	**10.62**	32.09	24.00	28.05	76.60
33	19.46	7.50	2.40	**9.79**	31.33	24.58	27.95	72.56
34	18.84	7.22	2.20	**9.42**	31.46	24.36	27.91	73.66
35	17.90	7.20	2.08	**9.06**	31.96	23.89	27.93	75.85
36	18.10	6.90	1.90	**8.97**	32.37	22.75	27.56	76.93
37	17.36	6.48	1.74	**8.53**	31.86	22.72	27.29	83.90
38	16.06	6.16	1.64	**7.95**	29.72	23.00	26.36	88.08
39	15.68	5.92	1.50	**7.70**	32.64	22.10	27.37	79.58
40	14.66	5.40	1.44	**7.17**	33.55	23.45	28.50	79.83
41	13.30	4.90	1.28	**6.49**	33.64	22.58	28.11	79.82
42	11.80	4.32	1.10	**5.74**	36.63	20.41	28.52	65.07
43	10.60	4.30	1.00	**5.30**	35.38	19.42	27.40	63.11
44	9.72	4.00	0.86	**4.86**	34.08	18.18	26.13	61.95
45	8.50	3.50	0.72	**4.24**	35.27	16.38	25.83	54.84
46	7.20	2.98	0.54	**3.57**	35.08	17.44	26.26	56.74
47	5.62	2.06	0.38	**2.69**	34.46	16.69	25.58	52.94
48	4.30	1.52	0.22	**2.01**	34.59	15.08	24.83	54.66
49	2.20	0.98	0.14	**1.11**	34.21	14.26	24.23	52.03
50	1.10	0.58	0.10	**0.59**	32.17	11.98	22.08	53.77
51	0.80	0.10	0.00	**0.30**	31.99	12.07	22.03	48.86
52	0.56	0.00	0.00	**0.19**	32.31	11.43	21.87	46.41
Mean	10.07	4.19	1.31	**5.19**				

SMW = Standard Meteorological Week

Table.3 Correlation of two spotted red spider mite, *T. urticae* Koch with the abiotic factors of poly house on rose (cv. Top secret)

Abiotic parameters	Year 2015	Year 2016	Pooled
Maximum Temperature (^{o}C)	0.379**	0.278*	0.327*
Minimum Temperature (^{o}C)	0.560**	0.866**	0.748**
Average Temperature (^{o}C)	0.512**	0.687**	0.611**
Average RH %	-0.060	0.740**	0.486**

*Significant at 5% level of significance

**Highly significant at 1% level of significance

The correlation between spider mite *T. urticae* and abiotic factors of poly house *viz.*, maximum temperature, minimum temperature, average temperature and average relative humidity of poly house were also worked out. It is clearly seen from table 3 that there were a highly significant positive correlation between population of spider mite *T. urticae* with minimum temperature (r=0.748), average temperature (r=0.611) and average relative humidity (r= 0.486). The maximum temperature had also a significant positive correlation (r= 0.327) with spider mite *T. urticae* population on rose.

Sudhirkumar and Shelke (2008) reported that the spider mite population started from 35th SMW with 1st peak at 42nd SMW and reached up to lowest population during 1st SMW. Whereas, pest population also started from 2nd SMW and reached its 2nd peak at 11th SMW. Dhar *et al.,* (2000) found 30 ºC temperature and 78.5 per cent relative humidity to be optimum for highest incidence of *T. urticae* (both eggs and mobile stages) on okra. Recently, Shah (2014) from Navsari also studied the seasonal activities of spider mite *T. urticae* under poly house gerbera and found that the eggs and mobile stages of *T. urticae* showed a non-significant negative correlation with temperature whereas, it had a significant positive correlation with relative humidity. It was also found that on gerbera the spider mite remains active throughout the crop season with a peak during 31st SMW (last week of July), thus more or less in support of the present findings. Further, Mazid *et al.*, (2015) from their studies on *Oligonychus coffeae* Nietner concluded that there was a significant positive correlation of the population of spider mites with the increasing temperature whereas moderate positive correlation existed between relative humidity. Further, the distribution of spider mite on the plant canopy was also recorded and it was found that maximum activities of *T. urticae* were recorded on top canopy followed by middle and bottom canopy. It was due to the continuous supply of vital nutrients which are nutritive for spider mite. In past, Shah (2014), Pokle and Shukla (2015) and Chauhan and Shukla (2016) also reported that the spider mite, *T. urticae* lays maximum eggs on top canopy of gerbera, tomato and French bean with maximum mobile stages.

Acknowledgement

The authors are thankful to the Professor and Head, Department of Entomology, N. M. College of Agriculture and The Principal, N. M. College of Agriculture, Navsari for providing necessary facilities during the present study. The authors are also thankful to the Director of Research and Dean, Post Graduate studies, Navsari Agricultural University, Navsari for their kind support and help during the study period.

References

Anonymous, 2016. National Horticulture Board, Gurgaon. Ministry of Agriculture, Government of India.

Chauhan, R., and Shukla, A. 2016. Population dynamics of two spotted spider mite, *Tetranychus urticae* Koch on French bean (*Phaseolus vulgaris* L.). *Inter. J. of Pl. Pro,* 9(2): 536-539.

Dhar, T., Dey, P. K. and Sarkar, P. K. 2000. Influence of abiotic factors on population build-up of red spider mite *Tetranychus urticae* on okra vis-à-vis evaluation of some new pesticides for their control. *Pestology,* 24(9): 34-37.

Mazid, S., Rajkhowa, R. C. and Kalita, J. C. 2015. Seasonal incidence of red spider mite, *Oligonychus coffeae* Nietner on tea plantation in Assam. *Indian Journal of Research,* 4(3): 6-7.

Pokle, P.P., and Shukla, A. 2015. Population dynamics of two spotted spider mite,

Tetranychus urticae (Koch) (Acari: Tetranychidae) on tomato under polyhouse condition. *J. Appl. Biosci.*, 41(2): 148-151.

Shah, D. R., 2014. Study on mite (*Tetranychus urticae* Koch.) infesting gerbera (*Gerbera jamesonii*) under polyhouse condition. M.Sc. (Agri.) Thesis submitted to Navsari Agricultural University, Navsari.

Sudhirkumar, S., and Shelke, S. S. 2008. Seasonal incidence of two spotted spider mite (*Tetranychus urticae* Koch.) on rose. *J. Maharashtra Agric. Univ*., 33(3): 406-407.

How to cite this article:

Desai, S.R., K.G. Patel and Abhishek Shukla. 2017. Seasonal Incidence of Spider Mite (*Tetranychus urticae* Koch) (Acari: Tetranychidae) Infesting Rose under Poly House Condition. *Int.J.Curr.Microbiol.App.Sci.* 6(9): 2661-2669.
doi: https://doi.org/10.20546/ijcmas.2017.609.328