

SHORT COMMUNICATION

Influence of weather parameters on the seasonal incidence of sucking pests of pomegranate, *Punica granatum* L. during *ambia bahar*

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The pomegranate, *Punica granatum* L. (Family: Punicaceae) is a favourite table fruit in the tropical and subtropical region of the world. The successful cultivation and effective utilization of this fruit crop depends upon the proper pest management practices. Pomegranate crop is mainly attacked aphids (*Aphis punicae* Passerini), thrips (*Scirtothrips dorsalis* Hood), whitefly (*Siphoninus phillyrae* Haliday) and fruit borer (*Deudorix isocrates* Fabricius). Sucking pests cause severe damage by desapping the plants. These secrete wax and excrete honey dew like substances on which black sooty mould develops, which hinders the photosynthetic activities which devitalizes the plant ultimately deteriorate the quality of the fruits. Keeping in view, the present study was undertaken deals with the population build-up of major sucking pests (aphids and whiteflies) on pomegranate in relation to weather parameters.

The field trial using cv. Arakta was carried out on 5 years-old orchard of pomegranate at Research Farm of AICRP on Arid Zone Fruits MPKV, Rahuri in *Ambia bahar* 2012 (January to June). The incidence of aphids and whiteflies were recorded on randomly selected 10 plants. On each tree, aphids and whiteflies populations was recorded on newly emerged from 5 twigs of 5 and 30 cm apical portion of each twig, respectively were tagged and observations were recorded at each meteorological week on every Monday for the period of six months. The data on weekly population of aphids and whiteflies were correlated with abiotic factors viz., maximum and minimum temperature, morning and evening relative humidity, sunshine hours and rainfall and subjected to simple correlation studies.

Aphid

It could be seen from the results presented in Table 1, the incidence of aphids was noticed throughout the season of *Ambia bahar* except the months of May and June. The incidence of aphids was recorded from 1st meteorological week with peak of 63.4 aphids/5 cm apical twig on 4th

meteorological week with corresponding weather parameters viz., maximum and minimum temperature, morning and evening relative humidity, sunshine period and rainfall were 29.57 and 13.54°C, 65.29 and 30.86 per cent, 8.53 hrs. and 0.00 mm, respectively. The aphid population was increasing trend (38.5 to 63.4 aphids) during 1st to 4th week of January and thereafter it showed decreased up to 4th week of April (51.3 to 3.1 aphids). The maximum and minimum temperature had significant negative correlation ($r = -0.88^{**}$ and $r = -0.79^{**}$) with build-up aphids population, while high relative humidity of morning and evening had positive correlation ($r=0.37$ and $r= 0.11$) and sunshine hours ($r=0.077$).

The results of present study are in accordance with Kulkarni (2007) reported that the incidence of aphids was noticed throughout the year except the month of May, June and July and its peak from October to March, i.e. during *Hasta bahar* (39.58 aphids/5 cm tender shoot tip) and low incidence in *Ambia bahar* (4.41) and *Mrig bahar* (3.67). Sreedevi and Verghese (2007) also reported that the *A. punicae* infestation was found during December to March, peaking in January and February and infestation declined after March. Karruppuchamy *et al.* (1998) recorded the maximum incidence of aphid, *Aphis punicae* on pomegranate during the third week of February and March in hill area at Yercaud and plains at Namakkal in Tamil Nadu, respectively. These results lend support to the present findings.

Whitefly

During the present study, there no incidence of whiteflies was recorded from 1 to 7 and 20 to 26 meteorological weeks. The whiteflies populations were first recorded on 8th meteorological week (3.8 nymphs and adults /30 cm length of twig) with peak 8.9 on 4th week of April and afterwards there was a steady decline. Weather parameters viz., maximum and minimum temperature, morning and evening relative humidity, sunshine period and rainfall were 37.57 and 19.76°C, 40.14 and 16.29 per cent, 10.14 hrs. and

0.00 mm, respectively was recorded during peak activity of whitefly incidence. However, meteorological week 8 to 17 showed increasing trend of whitefly infestation (3.8 to 8.9 whiteflies population).

The present findings are in agreement with Kulkarni (2007) who reported that the maximum build up of whiteflies (9.05% infested leaves) was found in the month of April, which declined steadily afterwards with minor fluctuations till October. Balikat *et al.* (1999) reported that severe incidence of whitefly (*S. phillyreae*) was observed in February-April, 1999 to the extent of 60 to 65 per cent

infested leaves/plant. Ash whitefly population was very high (40.4 to 70.3 per leaf) during February to May and very low (0.00 to 18.7 per leaf) from June to December when field studies were conducted in peninsular India from April 1997 to 1999 reported by Mani and Krishnamoorthy (2002).

There was a significant positive correlation between whiteflies population with maximum temperature ($r = 0.498^{**}$) and positive correlation with minimum temperature ($r = 0.110$) and sunshine hrs ($r = 0.155$) while morning and evening relative humidity had significant negative correlation ($r = -0.635^{**}$ and $r = -0.564^{**}$).

Table 1. Seasonal incidence of aphids and whiteflies on pomegranate in relation to weather parameters
Average

Month (2012)	Meteorological Week	No. of aphids per 5 cm twig	No. of whiteflies per 30 cm twig	Weather parameters					
				Temperature ($^{\circ}\text{C}$)		Relative humidity (%)		Sunshine (Hours)	Rainfall (mm)
				Maximum	Minimum	Morning	Evening		
January	1	38.5	0	31.59	13.10	64.00	25.88	8.59	0
	2	42.5	0	26.06	6.54	54.57	24.71	9.97	0
	3	52.2	0	28.60	9.00	60.00	27.43	9.86	0
	4	63.4	0	29.57	13.54	65.29	30.86	8.53	0
	Mean	49.15	0	28.96	10.55	60.97	27.22	9.24	0
February	5	51.3	0	29.51	13.41	65.71	33.00	8.97	0
	6	53.1	0	29.51	8.97	51.86	19.71	9.56	0
	7	34.2	0	32.29	12.01	57.57	19.47	9.43	0
	8	25.6	3.8	34.23	13.53	43.86	18.14	9.67	0
	Mean	41.05	0.95	31.39	11.98	54.75	22.58	9.41	0
March	9	19.5	4.2	33.74	11.76	53.57	14.14	9.77	0
	10	12.4	3.9	33.09	11.06	47.43	15.43	9.60	0
	11	10.2	4.1	34.91	13.93	36.86	15.43	9.37	0
	12	11.8	3.6	37.63	15.01	39.71	11.43	8.76	0
	13	11.2	4.3	38.11	16.70	35.57	13.14	8.57	0
	Mean	11.4	3.98	35.94	14.18	39.89	13.86	9.08	0
April	14	8.3	5.2	38.46	19.51	44.86	15.57	8.79	0
	15	6.3	6.8	38.63	20.74	44.14	17.29	9.00	0
	16	5.3	7.6	37.14	22.00	51.14	23.57	7.99	0
	17	3.1	8.9	37.57	19.76	40.14	16.29	10.14	0
	Mean	5.75	7.13	37.95	20.50	45.07	18.18	8.98	0
May	18	0	6.5	38.90	19.38	40.17	14.33	10.68	0
	19	0	5.1	38.26	21.60	59.29	24.57	9.91	0
	20	0	0	38.51	20.51	49.00	17.00	10.80	0
	21	0	0	39.88	21.50	45.50	16.50	10.98	0
	22	0	0	38.34	22.17	49.29	22.57	10.70	0
	Mean	0.0	1.28	38.75	21.45	50.77	20.16	10.60	0
June	23	0	0	35.71	24.20	55.43	34.29	6.27	0
	24	0	0	36.37	24.23	65.29	38.71	9.17	27.2
	25	0	0	34.89	26.29	62.86	38.00	6.44	0
	26	0	0	34.83	27.26	67.43	39.57	6.16	2.2
	Mean	0	0	35.45	25.49	62.75	37.64	7.01	7.35

Table 2. Correlation coefficient (r) between incidence of aphids and whiteflies on pomegranate and weather parameters

Pest	Weather parameters					Sunshine (Hrs.)	Rainfall (mm)
	Temperature (⁰ C)		Relative humidity (%)				
	Maximum	Minimum	Morning	Evening			
Aphids	-0.878**	-0.796**	0.372*	0.111	0.077	-0.185	
Whiteflies	0.498**	0.110	-0.635**	-0.564**	0.155	-0.184	

Significance levels: * 0.05, **0.01

The results of the present finding are in agreement with Shevale and Kaulgud (1998) revealed that the mealy bug, scale insect and whitefly were more abundant during *ambia bahar* having significant positive correlation with temperature and negative correlation with relative humidity.

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