

Incidence of aphids in different traps on potato in Gangetic plains of West Bengal

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ABSTRACT

A field experiment was conducted during *rabi* season of 2006-07 and 2007-08 at Adisaptagram Block Seed Farm, Hooghly, West Bengal to evaluate the population dynamics of aphids with the help of yellow pan trap and yellow sticky trap. The population of aphid catches was quite lower in yellow pan trap than yellow sticky trap. Aphids were first observed in traps during third week of December and the population of pests gradually increased to reach the peak in second week of February in the first year of study (2006-07) while in second year of study (2007-08) the aphid population appeared in second week of December and attained its peak by the end of February. The abiotic factors viz., temperature (maximum & minimum), relative humidity% (maximum & minimum) and bright sunshine hour had significant effect on aphid population. The same abiotic factors were quite different between the first and second year. This was due to the fact that the climatic conditions in second year varied distinctly from the first year.

Keywords: Potato, traps, aphids, Gangetic plains, West Bengal

Introduction

The fourth most important food crop in the world Potato is one of the major food crop in India and ranks third in the production in the world (Khurana & Naik 2003). West Bengal is one of the major potato growing states due to its favorable climate and soil. However, the infestation of different insect pests, acts as a barrier in the production of the crop. Aphids are one of the most important pests of this crop and are widely distributed all over the world affecting a large number of host plants. The virus spreading ability of aphids, viz., *Myzus persicae* (Sulzer) and *Aphis gossypii* Glover play important role in limiting disease free potato tuber production and cause quick degeneration of seed stocks and yield reduction in potato (Biswas *et al.* 2004). For effective

management of aphid species on potato, several broad spectrum synthetic organic pesticides are usually recommended. Various types of traps such as yellow pan trap and yellow sticky trap are used to evaluate for the management of aphids.

Materials and Methods

The experiment was conducted under field conditions during *rabi* 2006-07 and 2007-08 at Adisaptagram Block Seed Farm, Hooghly, West Bengal. The potato cv. Kufri Jyoti was flat sown at 60cm×20cm spacing at an area of (31.2×9.5) sq m. and all the agronomic practices were maintained. The sticky trap consisted of a small iron cylinder, measuring 24 cm in height and 14 cm in diameter, painted yellow, which was mounted vertically on an iron rod of 1.4 m., the

outer surface of the cylinder, was smeared with white petroleum jelly which was renewed whenever necessary. Two such traps were used for the experiment and placed 1.2 m above the ground in the potato field. Two rectangular galvanized iron trays (45cm×30cm×10cm), painted yellow on both inner and outer side were used. Three-fourth of each trays filled with water was replaced every time just after taking observation. The trays were placed at canopy of the plant. Few drops of insecticides were always added in the water so that the trapped insects died. The caught aphids in both types of traps were collected at one day interval from December to March and the number was counted. The meteorological data was collected with a view to determine the relationship between the trapped aphid population and abiotic factor.

Results and Discussion

The occurrence of aphids on both the traps was more or less similar. However, the number of winged aphid population trapped in sticky trap was higher than the water pan trap. The aphid population was distinctly variable from one crop season to another. In the yellow sticky trap, the pests were first observed during third week of December (Table 1). Then the population gradually increased and reached peak in second week of February and then declined. The aphid population in yellow pan water trap was first

recorded in second week of December and the peak was during the second week of February, followed by decline. The environmental conditions during which the aphids attained their peak ranged from 16.54-25.90°C temperature, 70.57-97.86% relative humidity and 3.21h bright sunshine. The aphid was first observed during the second week of December and peak by the end of February in yellow sticky trap while in yellow pan trap the aphid first appeared in third week of December and the peak in third week of February when the temperature ranged from 13.08-27.13°C, RH from 46.43-96.00% and BSS of 14.06 (Table 2). This study revealed that yellow sticky traps were more efficient than yellow water pan traps in describing the population dynamics of the pest (Das *et al.* 1996; Basky 2003; Biswas *et al.* 2005). The alate aphids first appeared in the traps during second to fourth week of December and then the population was gradually increased to reach the peak between second and fourth week of February, and then declined to become nil in traps during late March. These findings confirm those of earlier reports of Kishore & Verma (1987); Konar & Basu (1999) and Paul & Konar (2003). The present study also revealed that the aphid population was mainly dependent on temperature, relative humidity and bright sunshine hour. But the effects of different weather parameters were not similar from one year to another.

Table 1.

Weekly mean aphid population in yellow sticky traps and water pan trap during 2006-07

Months/ weeks	YST ₁	YST ₂	Mean	WPT ₁	WPT ₂	Mean	Temperature		Relative humidity%		BSS
							Max	Min	Max	Min	
December I	0.00	0.00	0.00	0.00	0.00	0.00	28.46	11.30	99.43	40.57	9.23
II	0.00	0.00	0.00	0.00	0.00	0.00	28.51	12.83	99.28	49.71	7.57
III	0.12	0.30	0.42	0.40	0.08	0.24	27.51	13.12	99.43	53.28	7.96
IV	6.32	13.96	10.14	5.90	1.42	3.66	27.18	12.37	99.56	49.78	7.86
January I	40.00	29.80	34.90	12.73	30.45	21.59	24.48	9.51	99.71	46.43	7.86
II	65.98	75.74	70.86	39.81	52.73	46.27	25.41	9.94	98.57	43.00	8.10
III	110.52	102.62	106.57	94.00	70.00	82.00	25.57	10.17	99.28	46.85	7.01
IV	120.36	129.36	124.86	95.01	111.33	103.17	28.11	12.62	99.10	49.00	7.38
February I	162.76	142.96	152.86	126.72	103.92	115.32	28.88	17.46	99.57	67.00	4.55
II	190.41	213.59	202.00	150.66	121.55	136.24	25.90	16.54	97.86	70.57	3.21
III	166.33	131.39	148.86	110.96	132.82	121.89	23.64	13.68	99.57	70.86	9.21
IV	75.23	86.01	80.62	74.02	46.54	60.28	30.65	15.64	98.28	50.28	9.53

YST = Yellow sticky trap; WPT = Water pan trap; BSS = Bright sunshine hour

Table 2.

Weekly mean aphid population in yellow sticky traps and water pan trap during 2007-08

Months/ weeks	YST ₁	YST ₂	Mean	WPT ₁	WPT ₂	Mean	Temperature		Relative humidity%		BSS
							Max	Min	Max	Min	
December I	0.00	0.00	0.00	0.00	0.00	0.00	27.74	14.93	97.43	52.28	7.48
II	0.20	1.40	0.80	0.00	0.00	0.00	26.71	12.88	96.28	50.57	7.60
III	8.00	2.66	5.33	0.05	0.43	0.24	25.10	10.98	97.57	44.86	8.24
IV	11.23	25.25	18.24	1.00	6.32	3.66	25.43	10.73	95.2	47.30	7.40
January I	38.41	50.59	44.50	25.68	17.50	21.59	26.17	10.50	94.71	43.28	8.33
II	82.36	71.16	76.76	32.57	59.97	46.27	28.16	11.54	94.28	39.00	8.96
III	126.33	112.51	119.42	90.58	73.42	82.00	27.86	14.00	94.28	42.14	7.80
IV	124.26	148.26	136.40	100.26	106.08	103.17	21.37	11.96	95.30	68.40	4.25
February I	140.38	189.22	164.80	118.36	112.28	115.32	25.63	12.98	94.14	50.28	7.60
II	222.22	174.44	198.33	124.00	148.48	136.24	24.43	13.76	94.00	52.00	7.18
III	210.11	220.83	215.47	168.29	136.37	152.33	27.13	13.08	96.00	46.43	14.06
IV	84.25	108.41	96.33	75.20	105.36	90.28	29.72	15.61	94.62	39.00	21.07

YST = Yellow sticky trap; WPT = Water pan trap; BSS = Bright sunshine hour

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