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Seasonal incidence of major insect pests on watermelon, *Citrullus lanatus* (Thunb.Matsumara and Nakai)

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ABSTRACT

Studies were carried out on the seasonal incidence of insect pests of watermelon. The major insect pests recorded were aphid (*Aphis gossypii* Glover), leafhopper (*Amrasca devastans* Ishida), thrips (*Thrips palmi* Karny), leafminer (*Liriomyza trifolii* Burgess) and red pumpkin beetle (*Raphidopalpa* (=*Aulacophora) foveicollis* Lucas). The maximum incidence of various pests was recorded during second to last week of March 2004 and the minimum incidence was recorded during second week of January 2004 and second to last week of February 2004.

KEYWORDS

Insect pests;
Watermelon;
Seasonal incidence.

INTRODUCTION

Watermelon is a favourite summer treat and forms a staple food both in fresh and preserved form[4]. The fruit is rich in sugar (Soluble solids) with a sugar content of 17 %. Production of watermelon is severely affected by a variety of insect pests *viz.*, red pumpkin beetle, *Raphidopalpa* (=*Aulacophora*) *foveicollis* Lucas; leafhopper, *Amrasca devastans* Ishida, thrips, *Thrips palmi* Karny; aphid, *Aphis gossypii* Glover and leafminer, *Liriomyza trifolii* Burgess. Information available on seasonal occurrence of these insect pests is scanty and hence the present study was taken up to understand the occurrence of the major pests of watermelon.

MATERIALS AND METHODS

Studies on the seasonal occurrence of insect pests on watermelon were carried out in two seasons *viz.*, December sown crop and February sown crop in farmers' holdings at Dodda Dasanur and Chinnamathampalayam, respectively in Coimbatore, Tamil Nadu, India.

Watermelon cv Arka Manik was sown in plot of 3.5×2m size at spacing of 180 × 90 cm with three replications. The first sowing was taken up in the last week of December 2003, second sowing was taken up in the second week of February 2004 and the subsequent sowings were done at fortnightly interval. Fortnightly observations were made on ten plants under each replication in each sowing.

Assessment of insect population

Sucking pest's *viz.*, leafhopper, aphid and thrips population was assessed from three leaves representing top, middle and bottom regions of the plant at fortnightly intervals in the vegetative phase upto harvest. The number of adults and nymphs were counted from each leaf using hand lens (10x) and for each treatment, ten plants were sampled per replication.

The foliage pests *viz.*, Leaf miner and Red pump-

Regular Paper

kin beetle population was assessed from three leaves representing top, middle and bottom regions of the plant at fortnightly intervals in the vegetative phase upto harvest. The number of fresh mines with maggot was counted in each leaf for leaf miner and by counting the number of beetle per ten plants at fortnightly intervals for red pumpkin beetle. For each treatment, ten plants were sampled per replication.

RESULTS AND DISCUSSION

Season I: December sowing

Aphids occurred in considerable numbers in all the three sowings taken up at Dodda Dasanur. The increased mean aphid population (60.47 Nos. per plant) was recorded at 60 days after sowing (DAS) in the sowing taken up during the last week of January 2004 followed by sowings taken up in the second week of January 2004 (51.43) and last week of December 2003 (24.67) (TABLE 1).

The leafhopper population was found to be the maximum at 60 DAS in the second sowing done during second week of January 2004 and a mean population of 20 Nos. per plant was observed followed by last week of January 2004 sowing (18.33) and last week of December 2003 sowing (4.13).

Thrips also occurred in large numbers at 60 DAS in the sowing taken up during last week of January 2004 (37.33) followed by second week of January 2004 sowing (24.66).

Among the defoliators, the incidence of leaf miner was predominantly seen by recording 18.33 mines per plant, 21.33 mines per plant and 4.33 mines per plant at 60 DAS in the first, second and third sowings, respectively.

Red pumpkin beetle was found to be building up in the first and second sowings from 45 to 60 DAS while in the third sowing, they were found increasing from 30 to 45 DAS.

Season II: February sowing

Among the sucking pests, aphids occurred predominantly in all the sowings taken up in Chinnamathampalayam. Four sowings taken up during February 2004, a maximum of 95.33 number of aphids

TABLE 1: Seasonal incidence of major pests on watermelon: Field trial I at Dodda Dasanur (Coimbatore district)

Major pests	Mean number per plant*											
	Last week of December 2003 sowing				Second week of January 2004 sowing				Last week of January 2004 sowing			
	15 DAS	30 DAS	45 DAS	60 DAS	15 DAS	30 DAS	45 DAS	60 DAS	15 DAS	30 DAS	45 DAS	60 DAS
Sucking pests												
Aphid	1.57	14.37	37.85	24.67	3.42	21.42	38.93	51.43	5.43	27.43	49.56	60.47
Leafhopper	0.66	2.33	2.89	4.13	1.34	3.27	5.18	20.00	2.97	6.27	11.07	18.33
Thrips	2.11	6.24	18.33	21.66	4.79	16.67	32.66	24.66	2.43	5.89	19.31	37.33
Defoliators												
Leaf miner	1.66	2.97	15.00	18.33	2.47	8.47	14.97	21.33	1.89	3.00	13.66	4.33
Red pumpkin beetle	2.00	2.00	5.66	6.33	1.00	1.00	7.33	6.66	0.73	0.85	2.83	1.00

DAS- Days after sowing, * Mean of three replications

TABLE 2: Seasonal incidence of major pests on watermelon: Field trial II at Chinnamathampalayam (Coimbatore district)

Major pests	Mean number per plant*															
	First week of February 2004 sowing				Second week of February 2004 sowing				Third week of February 2004 sowing				Last week of February 2004 sowing			
	15 DAS	30 DAS	45 DAS	60 DAS	15 DAS	30 DAS	45 DAS	60 DAS	15 DAS	30 DAS	45 DAS	60 DAS	15 DAS	30 DAS	45 DAS	60 DAS
Sucking pests																
Aphid	3.47	11.43	43.19	45.49	7.42	12.47	95.33	29.66	11.47	71.00	66.66	24.33	23.33	46.66	54.66	63.00
Leafhopper	13.24	16.00	51.66	4.86	7.66	54.00	12.66	13.66	2.47	21.74	3.65	2.93	5.47	47.63	8.97	6.25
Thrips	14.6	39.33	63.66	41.42	7.66	54.00	12.66	2.39	4.27	8.99	14.37	3.12	4.13	8.47	3.69	4.03
Defoliators																
Leaf miner	13.9	38.00	64.66	67.74	8.97	29.87	49.66	47.33	18.17	37.48	68.66	90.66	9.87	27.94	69.66	91.00
Red pumpkin beetle	1.33	3.00	4.33	3.27	1.49	2.97	7.33	2.35	1.33	4.83	3.11	3.42	2.74	3.78	2.83	4.26

DAS - Days after sowing, *Mean of three replications

per plant were recorded at 45 DAS in the sowing taken up during second week followed by third week of February 2004 sowing which recorded a mean aphid population of 71.00 at 30 DAS. Minimum aphid population (3.47) was recorded at 15 DAS in the sowing taken up during first week of February 2004 (TABLE 2).

A peak population of leafhopper was observed at 30 DAS (54.00 Nos. per plant) in the February second week sowing. The leafhopper population declined towards the fourth week of March in the sowings taken up during third and fourth week of February 2004. The maximum thrips population (63.66) was recorded during third week of March 2004 in February first week sowing. The population of thrips was less from second to fourth week of April 2004.

The leaf miner was recorded from third week of February 2004 to fourth week of April 2004. The peak infestation (91.00) was found during the last week of April 2004. The red pumpkin beetle was recorded during the third week of February 2004 to fourth week of March 2004. The peak infestation (7.33) was found during fourth week of March 2004 in the sowing taken up during second week of February 2004.

Among the two locations, the general incidence of insect pests was more in Chinnamathampalayam. Early sowing taken up during the last week of December 2003 recorded the minimum incidence of aphids. On the contrary, melon aphid appeared early in the season when most of the predators were inactive[3]. In the present studies, the peak population of aphid (95.33 Nos. per plant) was seen at 45 DAS in the sowing taken up during the second week of February 2004 at Chinnamathampalayam. The peak population of aphid in both the field trials under seasonal incidence coincided with third to fourth week of March 2004. The peak activity of aphids on watermelon was noticed during March in South West Florida[1].

The thrips population also started building up in the field after 45 DAS, though minor incidence was noticed in the early stage of the crop growth. In summer plantings, thrips densities varied from 2.7 to 27.0 individuals per leaf in Hawaii during August - September[2]. In present studies, thrips occurred in large numbers during the third week of March 2004 in both the locations.

Five generations of leaf miner might be possible in full sunshine during hot summer and all stages would be present from May onwards until autumn frost killed the foliage of the larval food-plants[6]. These results from the simulation agree well with the observation made at Efford during 1979[5]. In the present studies the peak infestation of leaf miner was seen from second week of March to the last week of April 2004 in the locations tested.

The leafhopper population at Chinnamathampalayam indicated that increased population was seen from 30 to 45 DAS, attaining the peak (54) in the sowing taken up during second week of February 2004. In the trial at Dodda Dasanur, the leafhopper was found in its maximum (20) at 60 DAS in the sowing taken up in the second week of January 2004. This indicated that the peak population of leafhopper coincides in both the trials with the second week of March 2004. It clearly indicates that the maximum population of leafhopper occurred in the second week of March 2004 irrespective of the location.

Red pumpkin beetle, the notorious pest on cucurbits, started building up when the plant was sufficiently grown with thick foliage by 45 to 60 DAS.

Conclusively, the last week of December 2003 sowing recorded lesser incidence of insect pests.

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