The Pharma Innovation Journal 2023; 12(9): 1126-1128

www.ThePharmaJournal.com

The Pharma Innovation

ISSN (E): 2277-7695
ISSN (P): 2349-8242
NAAS Rating: 5.23
TPI 2023; 12(9): 1126-1128

www.thepharmajournal.com
Received: 01-06-2023
Accepted: 04-07-2023

KP Budhvat
Shri Shivaji Agriculture College, Amravati, Maharashtra, India

MO Rajput
Samarth Agriculture College, Deulgaon Raja, Maharashtra, India

SR Pawar
Department of Entomology, B.A. College of Agriculture AAU, Anand, Gujarat, India

Corresponding Author:
SR Pawar
Department of Entomology, B.A. College of Agriculture AAU, Anand, Gujarat, India

Correlation studies between transplanting Periods and infestation of aphid, *Macrosiphoniella sanborni* (Gillette) in chrysanthemum, *Chrysanthemum coronarium* Linnaeus

KP Budhvat, MO Rajput and SR Pawar

Abstract
In order to handle the aphid, *Macrosiphoniella sanborni,* in Chrysanthemum a field experiment was carried out. The yield was also affected by the low aphid population, which was seen in the crops transplanted during the first week of February (1.40 to 25.78 per 15 cm twig), followed by the third week of January (5.18 to 52.45) and the third week of October (5.84 to 48.48). The incidence of aphid remained between 29 and 36 per 15 cm twig throughout the remainder of the transplanting periods (from the first week of November to the first week of January). Temperature, relative humidity, vapour pressure, and vapour pressure deficit all had a major influence on the pest's variation when taking into account its prevalence and the significance of meteorological elements throughout various transplanting times.

Keywords: Chrysanthemum, aphid, *Macrosiphoniella sanborni*, transplanting periods, weather factors

Introduction
The chrysanthemum (*Chrysanthemum coronarium* Linnaeus) is one of the most important commercial flower crops growing in Gujarat. About 840 MT of chrysanthemum flowers are produced in the Anand, Vadodara, Navsari, Surat, and Valsad districts (Dhaduk, 2004) [2]. A significant pest that attacks chrysanthemums and causes significant losses owing to constant feeding is the aphid, *Macrosiphoniella sanborni.* Plant development is hampered as a result, and occasionally entire plants dry out (Bhattacharjee and De, 2003) [1]. Chrysanthemum virus B and Chrysanthemum vein mottle virus are further plant viruses that are spread by aphids (Chan *et al*., 1991) [3]. The modification of planting time is a crucial element in today's pest control strategy for avoiding the pest population. The current investigations on various planting periods against the aphid, *M. sanborni*, which infests chrysanthemums were conducted with these viewpoints in mind.

Materials and Methods
Eight alternative transplanting times were tested against *M. sanborni* on a local variety of chrysanthemum over the winter: the third week of October, the first week of November, the third week of November, the first week of December, the first week of January, the third week of January, and the first week of February. The crop was transplanted at 45 x 45 cm in plots 9 x 4.5 m in accordance with the appropriate transplanting times. Four equal sectors of the layout were separated apart, and each segment was treated as one repeat. On randomly chosen five plants from each sector, measuring the population of aphids on a 15 cm long terminal twig was done at weekly intervals. Chrysanthemum flowers were harvested when they were ripe for harvesting and weighed. After translating the three pickings to tons per hectare, the flower production was tallied for additional statistical study.
The data on environmental physical factors, such as bright sunshine (BSS), wind speed (WS), rainfall (RF), maximum (MaxT) and minimum (MinT) temperatures, morning (RH1) and evening (RH2) relative humidity, morning (VP1) and evening (VP2) vapour pressure, and morning (VPD1) and evening (VPD2) vapour pressure deficit, were correlated in order to study the instantaneous effect of weather parameters on population fluctuation of M. sanborni. To determine the link with the incidence of aphids, department of meteorology, week-by-week data on various factors were employed.

Results and Discussion

Except for the crop transplanted during the first week of February, where two peaks were seen, only one peak (Table-1) was seen among the other transplanting times. Crops transplanted during the first week of November had an aphid activity range of 11.43 to 55.43 per 15 cm twig, whereas crops transplanted during the first week of February had an aphid activity range of 1.40 to 25.78 per 15 cm twig.

When crops were transplanted in the first week of November, the first week of December, the first week of January, and the third week of January, *M. sanborni* occurrence started at the third week after transplanting (WAT), but it first showed up two weeks later (5th WAT) in crops that were transplanted in the third week of October. The highest aphid population was found in crops that were transplanted in the third week of October, the first week of November, the first week of December, the first week of January, the first week of February, and the third week of December, respectively. These crops were transplanted in the third week of November, the first week of December, the first week of January, and the first week of February.

The average data on aphid population in various transplanting times (Table-2) showed a considerable influence on aphid activity. The transplanting times varied greatly from one another. Crops transplanted during the first week of February (13.56 per 15 cm twig) and the third week of January (16.28) had comparable populations but with noticeably lower densities. Aphid incidence was almost the same for crops transplanted in the third week of October (25.34), third week of November, and first week of January.

The crop was transplanted between the first and third weeks of December, when the population was larger and the number of aphids per 15 cm twig was 31.41 and 30.68, respectively. They were also on an equal footing with one another. Significantly, the crop that was transplanted during the first week of November had the highest (36.05) aphid population ever observed. Aphid *M. sanborni* on crop transplanted during the third week of October showed a significant negative correlation with maximum temperature (MaxT), vapour pressure deficit morning (VPD1), and vapour pressure deficit evening (VPD2) with "r" values of 0.674**, 0.639**, and 0.692**, respectively. In the crops transplanted during the third weeks of October and December, there was a statistically significant positive correlation between the aphid population and morning relative humidity (RH1) (r= 0.589* and 0.552*, respectively). On the other hand, a crop that was transplanted during the first week of February showed a strong positive correlation between the evening vapour pressure deficit (VPD2) and the aphid population. With "r" values of 0.859**, 0.891**, 0.839**, and 0.660**, respectively, MaxT, MinT, vapour pressure morning (VP1), and VPD2 had a very significant adverse effect on aphid activity in chrysanthemum transplanted during the first week of November. Vapour pressure evening (VP2) in the first week of November (r= 0.522); VPD1 (r= 0.502) and VPD2 (r= 0.601) in the third week of December; and RH2 (r= 0.525) and VP1 (r= 0.523) in the third week of January all significantly reduced the frequency of pest.

The flower production shown in Table 4 demonstrated considerable variations in the crops transplanted at various times. The crop that was transplanted during the third week of October had the highest flower output of all of the different transplanting times (23.78 tones/ha). The flower output from the crop transplanted during the first week of February, third week of January, first week of December, and first week of January (19.89 to 17.96 t/ha) did not differ statistically from one another. The crop transplanted in the third week of December had the lowest flower output (14.96 t/ha), which was comparable to the crops transplanted in the first and third weeks of November (15.25 and 16.09, respectively).

Very little is known about how transplanting times affect aphid incidence in chrysanthemum crops. However, *M. sanborni*, an aphid, was active on chrysanthemums from October to May, according to Saikia and Dutta (1998) [4]. The second fortnight of December had the highest population. In the current experiment, the maximal aphid activity was seen on chrysanthemums transplanted in the third week of October during the last week of December. On the other hand, minimal aphid populations were found in early seeded crops by Parsana *et al*. (2000) [5] in mustard and Meena *et al*. (2002) [6] in coriander. In the current experiment, an early-sown crop was severely infected by this insect in the first week of November. These variations might result from variations in the microclimate, agricultural ecology, and environmental conditions in a certain area.

Table 1: Incidence *M. sanborni* on chrysanthemum in different transplanting dates

Sr. No.	No. of aphids/ 15 cm twig at indicated week and date of transplanting periods																				
	SMW	WAT	3rd week of Oct.	SMW	WAT	1st Week of Nov.	SMW	WAT	3rd week of Nov.	SMW	WAT	1st Week of Dec.	SMW	WAT	3rd week of Dec.	SMW	WAT	1st week of Jan.	SMW	WAT	3rd week of Jan.	SMW	WAT	1st week of Feb.
1	43	2	-	45	2	-	47	2	5.33	49	2	-	51	2	2.09	1	2	0.00	4	2	-	6	2	-
2	44	3	-	46	3	11.43	48	3	9.31	50	3	5.69	52	3	10.88	2	3	6.09	5	3	3.38	7	3	-
3	45	4	-	47	4	15.78	49	4	12.99	51	4	7.78	1	4	20.48	3	4	9.68	6	4	8.25	8	4	6.04
4	46	5	5.84	48	5	24.83	50	5	17.68	52	5	11.18	2	5	26.58	4	5	15.68	7	5	12.68	9	5	9.09
5	47	6	11.99	49	6	29.23	51	6	24.09	1	6	21.10	3	6	37.26	5	6	24.32	8	6	19.57	10	6	13.36
6	48	7	17.37	50	7	34.44	52	7	25.79	2	7	28.05	4	7	44.63	6	7	31.64	9	7	27.32	11	7	18.24
7	49	8	23.33	51	8	42.23	1	8	29.60	3	8	38.34	5	8	54.19	7	8	38.98	10	8	32.65	12	8	15.16
8	50	9	29.92	52	9	44.48	2	9	33.33	4	9	48.82	6	9	61.09	8	9	43.17	11	9	39.15	13	9	19.77
9	51	10	34.98	1	10	50.07	3	10	38.83	5	10	56.30	7	10	52.13	9	10	47.48	12	10	28.62	14	10	25.78
10	52	11	43.45	2	11	55.43	4	11	46.49	6	11	63.01	8	11	46.61	10	11	52.45	13	11	21.33	15	11	20.59
11	52	12	48.48	3	12	51.70	5	12	51.01	7	12	58.54	9	12	30.28	11	12	49.34	14	12	15.39	16	12	16.54
12	1	13	33.87	4	13	47.61	6	13	50.67	8	13	44.46	10	13	20.94	12	13	33.16	15	13	9.96	17	13	10.97
13	2	14	23.04	5	14	42.53	7	14	43.50	9	14	27.83	11	14	14.68	13	14	20.68	16	14	5.81	18	14	5.78
14	3	15	18.07	6	15	37.51	8	15	33.87	10	15	19.25	12	15	7.70	14	15	10.86	17	15	2.53	19	15	1.40
15	4	16	13.69	7	16	31.21	9	16	20.21	11	16	9.36	13	16	-	15	16	5.18	18	16	1.23	20	16	-
16	5	17	-	8	17	22.26	10	17	-	12	17	-	14	17	-	16	17	0.00	19	17	-	21	17	-
Mean	-	-	25.34	-	-	36.05	-	-	29.51	-	-	31.41	-	-	30.68	-	-	29.90	-	-	16.28	-	-	13.56

SMW – Standard Meteorological Week
WAT – Week After Transplanting

Table 2: Impact of transplanting periods on population of *M. sanborni* on chrysanthemum

Transplanting periods	No. of aphids/ 15 cm twig
1	2
October 3rd week	25.33
November 1st week	36.04
November 3rd week	29.50
December 1st week	31.40
December 3rd week	30.67
January 1st week	29.89
January 3rd week	16.27
February 1st week	13.55
S. Em. ±	1.01
C. D. at 5%	2.96
C. V. %	8.65

Table 3: Correlation studies between incidence of aphid and different abiotic factors

Meteorological Parameters	Incidence of aphid							
	3rd week of Oct.	1st Week of Nov.	3rd week of Nov.	1st Week of Dec.	3rd week of Dec.	1st week of Jan.	3rd week of Jan.	1st week of Feb.
Maximum Temperature (MaxT)	-0.674**	-0.859**	-0.388	-0.174	-0.445	-0.010	-0.161	0.346
Minimum Temperature (MinT)	-0.509*	-0.891**	-0.427	-0.331	-0.480	-0.120	0.367	-0.142
Relative Humidity Morning (RH_1)	0.589*	0.055	0.206	0.252	0.552*	-0.030	-0.338	-0.661**
Relative Humidity Evening (RH_2)	0.483	-0.038	0.014	-0.136	0.322	-0.231	-0.525*	-0.874**
Vapour Pressure Morning (VP_1)	-0.410	-0.839**	-0.317	-0.226	-0.189	-0.194	-0.523*	-0.361
Vapour Pressure Evening (VP_2)	-0.086	-0.522*	-0.427	-0.317	-0.103	-0.355	-0.631**	-0.480
Vapour Pressure Deficit Morning (VPD_1)	-0.639**	0.459	-0.297	-0.341	-0.601*	-0.098	0.023	0.351
Vapour Pressure Deficit Evening (VPD_2)	-0.692**	-0.660**	-0.250	-0.100	-0.502*	-0.044	0.028	0.665**
Bright Sunshine Hours (BSS)	-0.425	-0.034	-0.026	-0.096	-0.413	0.201	0.169	0.004
Wind Speed (WS)	0.235	0.481	0.317	-0.069	-0.153	-0.168	-0.364	-0.446
Rainfall (RF)	-	0.063	0.382	0.439	0.446	0.048	-0.156	-0.281

Correlation is significant at the 5% level. ** Correlation is significant at the 1% level.

Table 4: Impact of different transplanting periods on flower yield of chrysanthemum

Transplanting periods	Flower yield (tones/ha)
1	**2**
October 3rd week	23.77
November 1st week	15.24
November 3rd week	16.08
December 1st week	18.40
December 3rd week	14.95
January 1st week	17.95
January 3rd week	19.56
February 1st week	19.88
S. Em. ± :	0.88
C. D. at 5%	2.61
C. V. %	9.74

Conclusion

Very less information is available about the correlation of transplanting periods and incidence of aphids in chrysanthemum. However, looking to the results it can be concluded that early transplantation of chrysanthemum would definitely help to reduce the incidence. Here it may be pssible that chrysanthemum colud escape the attack by early transplanting

References

1. Bhattacharjee SK, De LC. Advanced Commercial Floriculture. Publ. Perm C. Bakliwal Aavishkar New Delhi; c2003. p. 229-230.
2. Dhaduk BK. Floriculture in Gujarat. Floriculture Today, August; c2004. p. 29-30.
3. Chan CK, Forbes AR, Raworth DA. Aphid transmitted viruses and their vector of the world. Publ. by Agric. Canada Res. Branch Tech. Bull; c1991. p. 216.
4. Saikia K, Dutta BC. Screening of some chrysanthemum varieties co-resistance to *Macrosiphoniella* (Gillette). Journal of Agriculture Science. 1998;11(2):167-171.
5. Parsana GJ, Vyas HJ, Bharodia RK. Effect of date of sowing on the incidence of mustard aphid, Lipaphis erysimi Kalt. GAU Research Journal. 2000;26(1):30-36.
6. Meena PC, Sharma JK, Noor A. Varietal reaction of coriander (*Coriandrum sativum* L.) and impact of date of sowing on incidence of aphid (*Hyadaphis coriandri* Das). Indian Journal of Entomology. 2002;64(1):58-62.