

Original Research Article

Effect of different sowing dates on the incidence of aphid, *Hyadaphis coriandari* (Das) on Fennel *Foeniculum vulgare* (Mill.)

L.G. Hake*, H.L. Deshwal and V.S. Yadav

Department of Agricultural Entomology, College of Agriculture, Bikaner
Swami Keshwanand Rajasthan Agricultural University, Bikaner- 334006, Rajasthan, India

*Corresponding author

ABSTRACT

The field experiment was conducted during the year 2008-09 to study the effect of different sowing dates on the incidence of aphid, *Hyadaphis coriandari* (Das) on fennel. It was revealed that minimum incidence (57.60 aphids per plant) during peak period was recorded from the crop sown on 20th October, followed by crop sown on 30th October and 10th November which exhibited 64.75 and 74.05 aphids per plant, respectively. However, maximum infestation (118.30 aphids per plant) was recorded in late sown crop *i.e.* 30th November. It was concluded that the aphid population increased with the delay in sowing time. The maximum seed yield of 12.65 q ha⁻¹ was recorded from 30th October sown crop and remained at par with the crop sown on 20th October 12.48 q ha⁻¹. The crop sown on 10th November and 20th November gave 11.16 and 9.85 q ha⁻¹ seed yield, respectively. The minimum seed yield 8.25 q ha⁻¹ was obtained from the crop sown on 30th November. A significant positive correlation ($r = 0.973$) was obtained between sowing dates and aphid population which indicated that the aphid population increased with the delay in sowing time. The relationship between the sowing dates and seed yield revealed a negative correlation ($r = -0.952$). A negative correlation ($r = -0.978$) was also recorded between aphid population and seed yield.

Keywords

Aphids,
Hyadaphis coriandari,
Fennel,
Incidence,
Sowing dates

Introduction

Fennel (*Foeniculum vulgare* Mill.) belongs to family *Apiaceae*, commonly known as *Saunf*, one of the important condiments produced in India for domestic and export purpose. The seed of fennel contain 9.5 per cent protein, 10.0 per cent fat, 18.5 per cent crude fibre, 42.3 per cent carbohydrates and 13.4 per cent minerals and also rich in vitamins and volatile oil (Pruthi, 1976). Fennel seed for its fragrant odour and pleasant aromatic taste is widely used in soups, pickles, pastries, confectionaries, and meat dishes. Fennel is used as important

ingredient in several allopathic as well as ayurvedic medicines. Dried fruits of fennel used as a masticating or for chewing alone or in *paans*.

It is native of Southern Europe and Mediterranean region; India is said to be the "Home of spices". In India it is cultivated in an area of 48.53 thousand hectare having an annual production of 62.25 thousand tones with a productivity of 1283 kg ha⁻¹ (Anonymous, 2008). Besides, India it is cultivated in Russia, Germany, Italy, Japan,

Argentina and U. S. A. (Pruthi, 1976). Rajasthan is the largest producer of fennel in India. In Rajasthan, it is cultivated in an area of 9095 ha with annual production of 7629 tones and productivity of 839 kg ha⁻¹ (Anonymous, 2008).

The fennel growing districts in Rajasthan are Sirohi, Tonk, Jodhpur, Baran, Pali, Bikaner, Dausa, Alwar, Sawai Madhopur and Jaipur. With the increasing and indiscriminate use of insecticides, insects have developed resistance against them. Moreover, insecticides cause environmental pollution, which makes life more miserable and increase the health hazards to mankind and animals. Hence, a cultural method to manage the insect pest of fennel by the way of altering the sowing time of fennel crop was attempted in the present investigation. It is well known that attacks of insect pest are associated with climatic conditions and crop growth stage at a particular time. Hence, alternations in sowing time cause a significant effect on the infestation of a specific pest on a given crop. Earlier, this practice was evaluated by Kanwat (1988) on fennel and other workers on different crops, but the climatic conditions have changed now which needs to reconsideration.

Materials and Methods

the experiment was laid out in a randomized block design (R.B.D.) with five treatments (sowing dates) and four replications. The plot size was 3 x 2 m² with row to row and plant to plant distance of 40 and 15 cm, respectively.

The variety RF-125 procured from Agricultural Research Station, Swami Keshwanand Rajasthan Agricultural University, Beechwal, Bikaner was used to study the incidence of fennel aphid and the crop allowed to natural infestation.

There were five different dates of sowing of fennel crop during the year viz., *rabi* 2008-09.

1. 20th October
2. 30th October
3. 10th November
4. 20th November
5. 30th November

Five plants were randomly selected and tagged in each plot when the crop was 30 days old. Frequent visits to the field were made to note the first appearance of aphid, *Hyadaphis coriandari* (Das) on the crop. Further, Three umbels (lower, middle and upper), each of the five tagged plants, were labeled to record the aphid population. The population of aphids was counted early in the morning before 9 AM. Observations on aphid population were recorded at weekly interval from appearance of pest till the harvesting of the crop.

The correlation coefficient (r) between date of sowing and aphid population; date of sowing and yield; aphid population and yield were also determined by subjecting the data to simple correlation coefficient (r).

Results and Discussion

the data presented in Table 4.1 revealed that the aphid population increased with the delay in sowing time. The crop sown on 20th October exhibited minimum population 57.60 aphids per plant during peak as compared to the crop sown on 30th October which had 64.75 aphids per plant however, remained statistically at par. The maximum population 118.30 aphids per plant was recorded on the crop sown on 30th November followed by 20th November and 10th November sown crops which exhibited 90.65 and 74.05 aphids per plant respectively, however, differed significantly

to each other. After peak infestation, aphid population declined gradually. The maximum seed yield of 12.65 q ha⁻¹ was recorded from 30th October sown crop and remained at par with the crop sown on 20th October 12.48 q ha⁻¹. The crop sown on 10th November and 20th November gave 11.16 and 9.85 q ha⁻¹ seed yield, respectively. The minimum seed yield (8.25 q ha⁻¹) was obtained from the crop sown on 30th November.

A significant positive correlation (r = 0.973) was obtained between sowing dates and aphid population which indicated that the aphid population increased with the delay in sowing time Table 2. The relationship between the sowing dates and seed yield revealed a negative correlation (r = -0.952). A negative correlation (r = -0.978) was also recorded between aphid population and seed yield.

Table.1 Effect of sowing dates on the incidence of aphid, *H. coriandari* and yield of fennel

Sowing Dates	Number of aphids / plant on different sowing dates							Yield (q ha ⁻¹)
	Standard meteorological weeks of observations						Mean	
	(9)	(10)	(11)	(12)	(13)	(14)		
20 th October, 2008	5.05 (2.35)*	13.55 (3.74)	57.60** (7.62)	37.45 (6.16)	15.30 (3.97)	3.75 (2.04)	22.11 (4.75)	12.48
30 th October, 2008	6.65 (2.67)	16.30 (4.09)	64.75 (8.07)	42.35 (6.54)	17.75 (4.27)	4.80 (2.30)	25.43 (5.09)	12.65
10 th November, 2008	8.75 (3.04)	19.45 (4.46)	74.05 (8.63)	49.60 (7.07)	22.15 (4.75)	6.45 (2.63)	30.08 (5.52)	11.16
20 th November, 2008	11.20 (3.42)	23.00 (4.84)	90.65 (9.54)	62.55 (7.94)	29.10 (5.44)	8.85 (3.05)	37.56 (6.16)	9.85
30 th November, 2008	14.10 (3.82)	27.10 (5.25)	118.30 (10.80)	82.20 (9.09)	37.68 (6.18)	11.50 (3.46)	48.48 (6.99)	8.25
S. Em±	0.108	0.116	0.148	0.127	0.099	0.085	0.110	0.33
C.D. at 5%	0.33	0.35	0.45	0.39	0.30	0.26	0.34	1.02

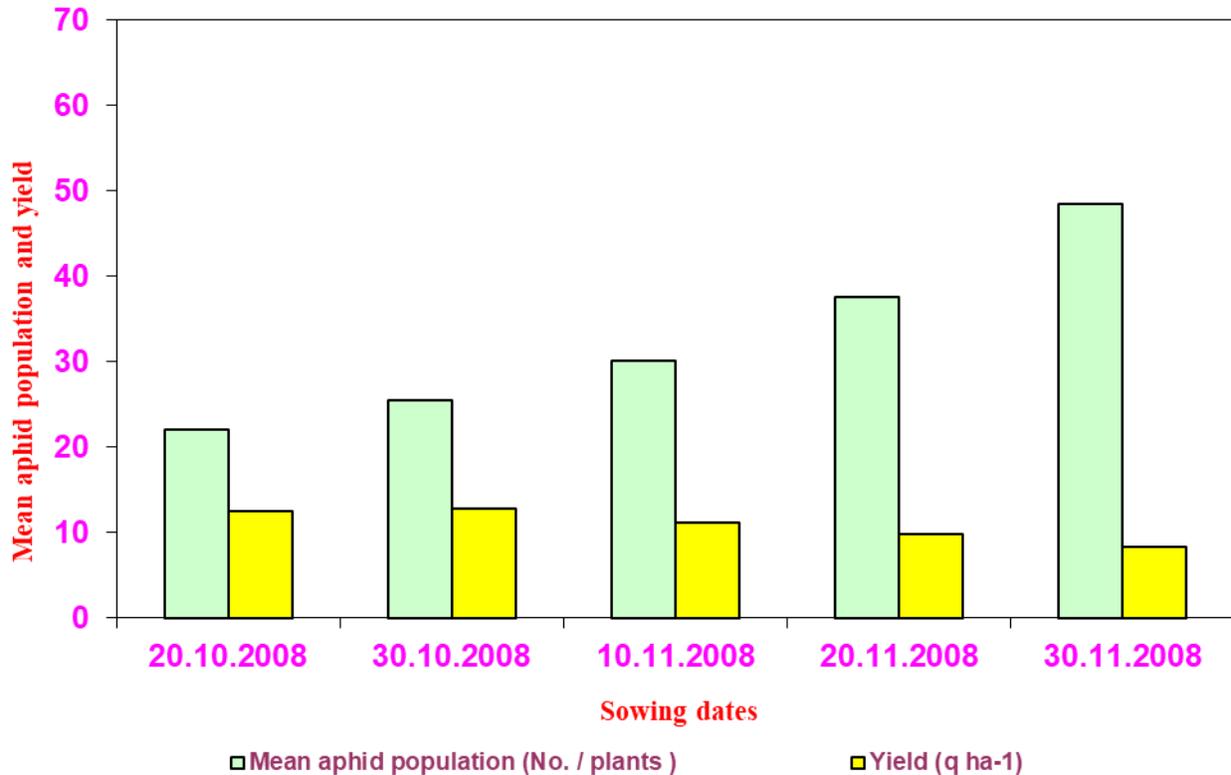
* Figures in parentheses are log $\sqrt{x + 0.5}$ values ** Peak aphid population during crop seasons

Table.2 Correlation between sowing dates, aphid population and seed yield of fennel

S. No.	Particulars	Correlation coefficients (r)
1.	Sowing dates and aphid population	0.973
2.	Sowing dates and seed yield	- 0.952
3.	Aphid population and seed yield	- 0.978

* Significant at 5% level of Significance

Fig. 4.1 Effect of sowing dates on aphid population and seed yield of fennel



These results are in agreement with those of Choudhary *et al.* (2007) that reported minimum incidence of aphid (173.70 aphids per plant) on early sown crop of fennel (15th October) and maximum (288.57 aphids per plant) on late sown crop (15th November). Further, he recorded highest seed yield (10.97 q ha⁻¹) in crop sown on 25th October whereas, minimum seed yield (6.13 qha⁻¹) in 15th November sown crop. Similarly, reported that population of aphid, *H. coriandari* attacking fennel increased on an average of 102.38 aphids per plant and reduction in yield was 1.609 q ha⁻¹ for each delay by 15 days in late sowing beyond 1st November. The present finding also get support from the observations of Kanwat (1988), Jain and Yadava (1989a), Lekha, (2002), Meena *et al.* (2002), Kumari and Yadava (2004) and Bana (2007) reported that October sown crop of coriander was less infested by *H. coriandari* that gave

higher yield in comparison to late sown crop was found highly significant and positive correlation between sowing dates and aphid population on all the tested genotypes of coriander also support the present finding.

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