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EFFECT OF SOWING DATES ON THE INCIDENCE OF *RHOPALOSIPHUM MAIDIS* (FITCH) ON BLOND PSYLLIUM, (*PLANTAGO OVATA*) FORSK.

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ABSTRACT

The present investigations on 'Effect of sowing dates on the incidence of *Rhopalosiphum maidis* (Fitch.) on blond psyllium, *Plantagoovata* Forsk' were carried out at Agronomy farm, College of Agriculture, (SKRAU), Bikaner during *rabi* 2009-10. The experiment conducted on five different sowing dates revealed that early sown crop (6th November) had the minimum infestation of aphids and highest seed yield as compared to the late sown crop (4th December).

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INTRODUCTION

Isabgol is also known as blond psyllium, ispaghula, ispogel or Indian plantago (Trease and Evans, 1978). It belongs to the family Plantaginaceae with chromosome number 2n = 8 (Bassett and Baum, 1969). Isabgol is a plant of West Asian origin and was introduced in India during Muslim settlement in middle age. Isabgol is the first ranking export commodity among medicinal plants in India. India continues to rank first in its production and trade in the world market. Isabgol is a medicinal plant valued for its thin white husk on seed which is prescribed as a drug for certain ailments in Unani and Ayurvedic systems of medicine (Karnick, 1976). It is used as laxative in traditional system of medicine, being beneficial in habitual constipation, chronic diarrhea, dysentery and irritation of digestive tract. It has the property of absorbing and retaining water (40-90%) and therefore works as an anti-diarrhea drug. The low productivity of the crop is attributed due to the attack of insect pests and diseases. Among the insect pests exercising heavy toll of blond psyllium crop include aphids, *Rhopalosiphum maidis* (Fitch.), *Aphis gossypii* Glov.; field cricket, *Gryllus* sp.; whitefly, *Bemisia tabaci* (Genn.) and field termites, *Odonto termeso besus* Rambur and *Microtermesobesi* Holmgren. Isabgol crop is attacked by number of insect pest, out of which aphid, Aphis gossypii Glover (Homoptera: Aphididae) has been reported as major pest of isabgol (Sagar and Jindla, 1984). The chemical control has been suggested by some workers to struggle the insect pests of blond psyllium (Babu *et al*., 2006) but due to one or the other reasons, it could not become panacea in the protection of the crop. Therefore, development of IPM modules might be considered to be only answer of the problem. The available literature indicated that not much work has been done on date of sowing specially in the arid-region of Rajasthan. Assessment of optimum sowing time has also been recognized as one of the main pre-requisites for the establishment of effective integrated pest management programme which has been examined in the paper.

MATERIALS AND METHODS

An experiment was laid out in a simple randomized block design with five different dates of sowing (Table 1), each date replicated five times. The seeds of blond psyllium (variety RI-89) were sown in the plots measuring 2 x 3 m of seven days intervals, starting from 6th November to 4th December, 2009. The row to row and plant to plant distance of 30 cm and 5 cm was maintained respectively. The crop was allowed to have natural insect infestation.The observations on aphid population were recorded at weekly intervel from five randomly selected tagged plants from each experimental plot soon after the appearance to till harvesting the crop. Seed yield was also recorded after harvesting the crop. The per plot yield was converted into yield per hectare. The peak population of aphids recorded on different dates of sowing were transformed into log (x + 1) values. The correlation coefficient and regression equations of date of sowing with aphid and yield were worked out by

subjecting the data to simple correlation coefficient (r) and liner regression analysis. Coefficient of determination (variance explained) was calculated by simple correlation coefficient.

RESULTS AND DISCUSSION

The data on effect of different sowing dates on the incidence

Table 1: Different dates of sowing of blond *psyllium*

S.NO.	Dates of Sowing
1.	06th November, 2009
2.	13th November "
3.	20st November "
4.	27th November "
5.	04th December "

Table 2: Regression equation between dates of sowing and incidence of *R. maidis* and yield of *P.ovata* during *rabi*, 2009-10

S.No	Particulars	Correlation coefficient (r)	Regression equation $Y = a + b B_{yx} X$	Coefficient of determination
1.	Sowing dates v/s Aphid incidence	0.87201	23.076 +6.656x	76.04
2.	Sowing dates v/s grain yield	-0.98913	10.054 -1.158x	97.84

Table 3: Effect of dates of sowing on the incidence of *Rhopalosiphum maidis* and yield of *P. ovata* during *rabi* 2009-10

S.N.	Date of sowing	Mean aphid population per tiller									Mean of the season	Seed Yield (q/ha)
		17.01.10	24.01.10	31.01.10	07.02.10	14.02.10	21.02.10*	28.02.10	07.03.10	14.03.10		
1.	06.11.09	9.43 (1.01)**	15.46 (1.21)	34.14 (1.54)	37.17 (1.58)	48.36 (1.69)	59.43 (1.78)	28.13 (1.46)	13.16 (1.14)	1.48 (0.39)	27.42 (1.31)	7.35 (0.91)
2.	13.11.09	7.18 (0.90)	12.09 (1.11)	30.27 (1.49)	40.06 (1.61)	52.17 (1.72)	75.24 (1.88)	47.10 (1.68)	24.18 (1.40)	10.29 (1.05)	33.18 (1.43)	7.10 (0.90)
3.	20.11.09	7.03 (0.90)	13.11 (1.14)	36.33 (1.57)	41.27 (1.62)	54.49 (1.73)	123.14 (2.09)	79.24 (1.90)	56.16 (1.76)	35.21 (1.56)	49.55 (1.59)	6.05 (0.85)
4.	27.11.09	5.33 (0.79)	11.05 (1.07)	26.09 (1.42)	53.67 (1.74)	85.62 (1.94)	127.73 (2.11)	90.79 (1.96)	60.36 (1.79)	39.55 (1.61)	55.58 (1.60)	4.95 (0.77)
5.	04.12.09	4.40 (0.73)	10.65 (1.06)	25.21 (1.42)	50.90 (1.71)	79.28 (1.90)	119.28 (2.08)	69.33 (1.85)	54.33 (1.74)	32.11 (1.52)	49.50 (1.56)	3.90 (0.69)
SEm ±		0.02	0.02	0.02	0.02	0.03	0.01	0.03	0.02	0.02	0.03	0.03
CD (p = 0.05)		0.07	0.05	0.07	0.05	0.08	0.04	0.08	0.07	0.05	1.10	0.11

* Peak population of aphid during the crop season; **Figures in parentheses are log (x + 1)

of *R. maidis* revealed that there was least incidence of *R. maidis* on early sown crop (6th November) with 27.42 aphids/ tiller followed by crop sown on 13th November (33.18 aphids/ tiller) (Table 3).The population of the pest was found in the increasing trend on 24th January, 2010 which ranged from 10.65 to 15.46 aphid tiller^{-1}. The population of aphid was highest on the crop sown on 6th November (15.46 aphids tiller^{-1}) differed significantly over rest of sowing dates. However, maximum infestation was recorded on 27th November sown crop (55.58 aphids/ tiller) followed by 20th Nov. and 4th December sown crop. This indicates that the expected aphid population increased per tiller during the season with the delay in sowing of the crop by every week. These results was in close confirmity with the findings of Singh (1979) who has reported the maximum population of aphids on late sowing crop of blond psyllium.The highest seed yield was obtained in the crop sown on 6th November (7.35 q ha^{-1}) followed by 13th November (7.10 q ha^{-1}) (Table 3). The crop sown on and after of 20th November showed the considerable decrease trend in the seed yield and the crop sown on 4th December had lowest seed yield of 3.90 q ha^{-1}. Hence, sowing of the blond psyllium in the second week of November in Rajasthan could be recommended to protect the crop from the incidence of *R. maidis* and to get the higher yield. The maximum aphid activity was observed during January to last week of February. Trehan *et al.* (1970) also reported that early maturing varieties of blond psyllium escaped from the aphid infestation.

As evident in (Table 2) a significant positive correlation was observed in between the sowing dates and aphid population (r = 0.87) and the seed yield was negatively correlated with sowing dates (r = -0.99).The variations explained by the equation was 76.04 per cent during the crop season. The regression equation of sowing dates and yield of blond psyllium showed the relationship between dates of sowing as X and yield (q ha^{-1}) as Y_2 during *rabi* 2009-10. The variation explained by the equations was 97.84 (Table 2). The expected yield decreased by 1.158 q ha^{-1} during the study with the delay in sowing of the crop by a week. The results also got support from the findings of Robinson and Hsu (1963) who reported that many thousand acres of late sown barley crop was destroyed by *R. maidis*.

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