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Seasonal incidence of buckwheat (*Fagopyrum esculentum* Moench) aphid (*Aphis gossypii* Glover) at Mainpat, Chhattisgarh

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Abstract

Studies were carried to the seasonal incidence of major insect pest of buckwheat (*Fagopyrum esculentum* Moench) was conducted during 2022-23 at Potato and Temperate Fruits Research Station Mainpat, Surguja (Chhattisgarh). The seasonal incidence of aphid (*Aphis gossypii* Glover) population was recorded on buckwheat (*Fagopyrum esculentum* Moench) indicated that the population commenced from 29 Days after Sowing (DAS) i.e., last week of October (44th SMW) and persisted till second week of February (6th SMW) which ranged from 3.60 to 40.20 aphid/twig/plant. The aphid (*Aphis gossypii* Glover) population was showed non-significant correlation with among the weather factor except maximum temperature ($r = -0.516^*$), which showed significant negative correlation with aphid population.

Keywords: Buckwheat, *Fagopyrum esculentum* Moench, *Aphis gossypii* Glover

Introduction

The buckwheat (*Fagopyrum* sp.) is an herbaceous flowering plant belonging to the Polygonaceae family and their grains have excellent nutritional value. In India, only common buckwheat (*Fagopyrum esculentum* Moench) and tartary buckwheat (*Fagopyrum tataricum* Gaertn) are cultivated under low input conditions and adapted to highland regions (Chauhan *et al.*, 2010) [2]. The plant produces many small white or pink flowers which, when pollinated, quickly produce seeds. The seeds are triangular and change from light green in color, to red-brown. Buckwheat is sometimes referred to as a pseudocereal because the grain is used in ways similar to cereal grains such as oats, but it is not a true cereal crop due to seed and plant type. Buckwheat is less productive crop than true grain field crops on good fertile soils but is particularly adapted to arid hilly land and cool climate regions. Buckwheat can be grown as a late-season crop because it is maturing quickly and sown as cover or rotational crop.

The common name of buckwheat is Tau in Chhattisgarh and Kuttu in Uttar Pradesh. In most Northern and Western states of India, the buckwheat flour is called as Kuttu ka atta and is consumed by the Hindus on particular fasting days, especially during Navaratri.

Materials and Methods

Studies the seasonal incidence of aphid (*Aphis gossypii* Glover) populations on buckwheat (*Fagopyrum esculentum* Moench) from germination to maturation stage of the crop. Observation of insect pests incidence was recorded from 10 randomly selected and tagged plants from the untreated plot on top 10 cm. twig/plant at weekly interval from initial appearance to final disappearance of the pest on buckwheat (*Fagopyrum esculentum* Moench) crop (Sahoo 2012) [3]. This observation was taken during early morning from 6 to 10 am and late hour of evening. The weather data such as maximum and minimum temperature (°C), morning and evening relative humidity (%), rainfall (mm.) and sunshine (hours) were collected from the weather station at Potato and Temperate Fruit Research Station Mainpat, Surguja District (C.G.) 497001.

Table 1: Record the aphid population on buckwheat (*Fagopyrum esculentum* Moench) during Rabi season 2022-23 at Mainpat, Surguja (Chhattisgarh)

SMW	Date of observation	Aphid/twig/plant (*) (10 cm. of shoot)
44	30-10-2022	3.60
45	06-11-2022	9.10
46	13-11-2022	12.80
47	20-11-2022	21.40
48	27-11-2022	26.50
49	04-12-2022	38.10
50	11-12-2022	33.60
51	18-12-2022	47.80
52	25-12-2022	50.90
1	01-01-2023	62.80
2	08-01-2023	53.30
3	15-01-2023	59.20
4	22-01-2023	49.00
5	29-01-2023	54.10
6	05-02-2023	40.20
	Mean	37.50

*Average population/twig/plant, SMW= Standard Meteorological Week

Results and Discussion

The seasonal activity of aphid (*Aphis gossypii* Glover) population was presented in (Table 1) and depicted in (Fig.1) indicated that the population commenced from 29 Days After Sowing (DAS) i.e., last week of October (44th SMW) and persisted till second week of February (6th SMW) which ranged from 3.60 to 40.20 aphid/twig/plant. The initial infestation of aphid was noticed on buckwheat (*Fagopyrum esculentum* Moench) during last week of October (44th SMW) with 3.60 aphid/twig/plant at flowering stage. The population was gone up and down in a fluctuating manner during the observation period. The aphid

population was suddenly increase and reached at its peak during first week of January (1st SMW) with 62.80 aphid/twig/plant at fruiting stage. Thereafter, the population was gone down in fluctuating manner and their population was decreased with 40.20 aphid/twig/plant. In whole observation the average population of the aphid (*Aphis gossypii* Glover) was recorded on buckwheat (*Fagopyrum esculentum* Moench) with 37.50 aphid/twig/plant.

Correlation with weather data

The population of aphid (*Aphis gossypii* Glover) was showed significant negative correlation with maximum temperature ($r = -0.516^*$) and remaining other factor viz., minimum temperature, average temperature, maximum relative humidity, minimum relative humidity, average relative humidity and rainfall showed non-significant correlation (Table 2). The current finding in buckwheat is in consistent with previous findings. In the buckwheat, Shukla (2014) ^[4] discovered a significant negative correlation with maximum temperature and minimum temperature.

Table 2: Correlation coefficient and regression coefficient between different abiotic factors and aphid (*Aphis gossypii* Glover) population on buckwheat

Weather parameters	Aphid	
	r	byx
Maximum temperature (°C)	-0.516*	-6.167
Minimum temperature (°C)	0.140	-
Average temperature (°C)	-0.193	-
Maximum RH (%)	-0.264	-
Minimum RH (%)	-0.498	-
Average RH (%)	-0.418	-
Rainfall (mm.)	-	-
Sunshine	-0.477	-

** Significant at 1% level of significance * Significant at 5% level of significance

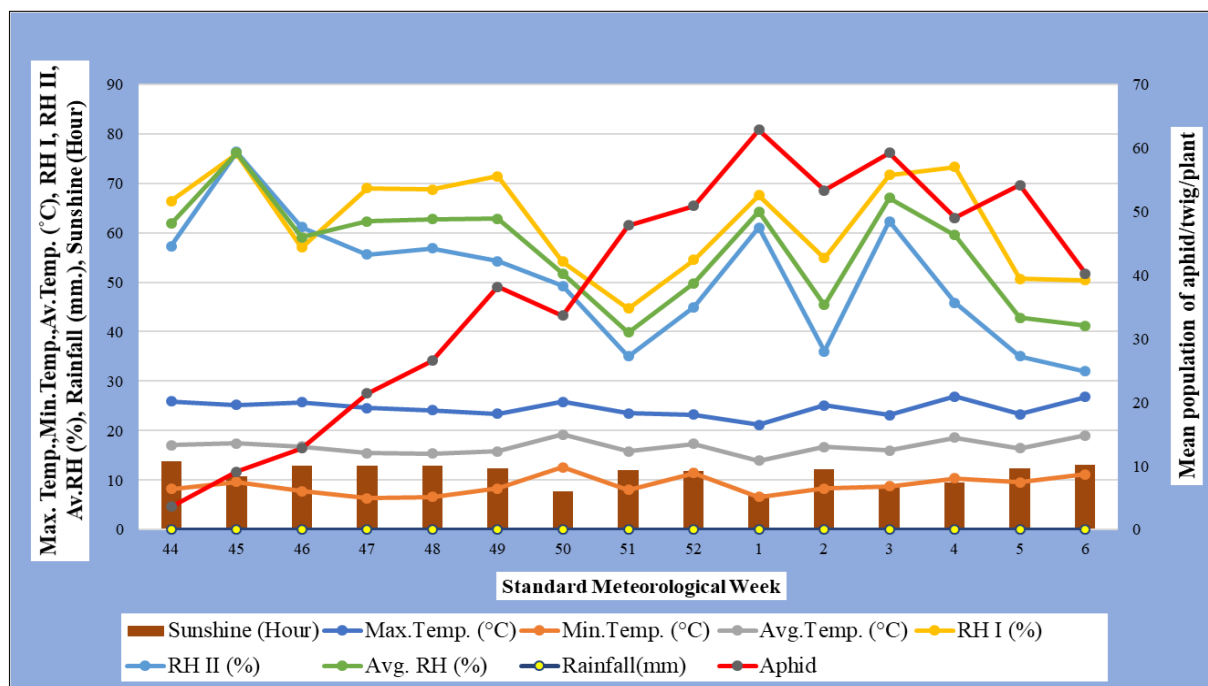


Fig. 1: Seasonal incidence of aphid (*Aphis gossypii* Glover) on buckwheat (*Fagopyrum esculentum* Moench)

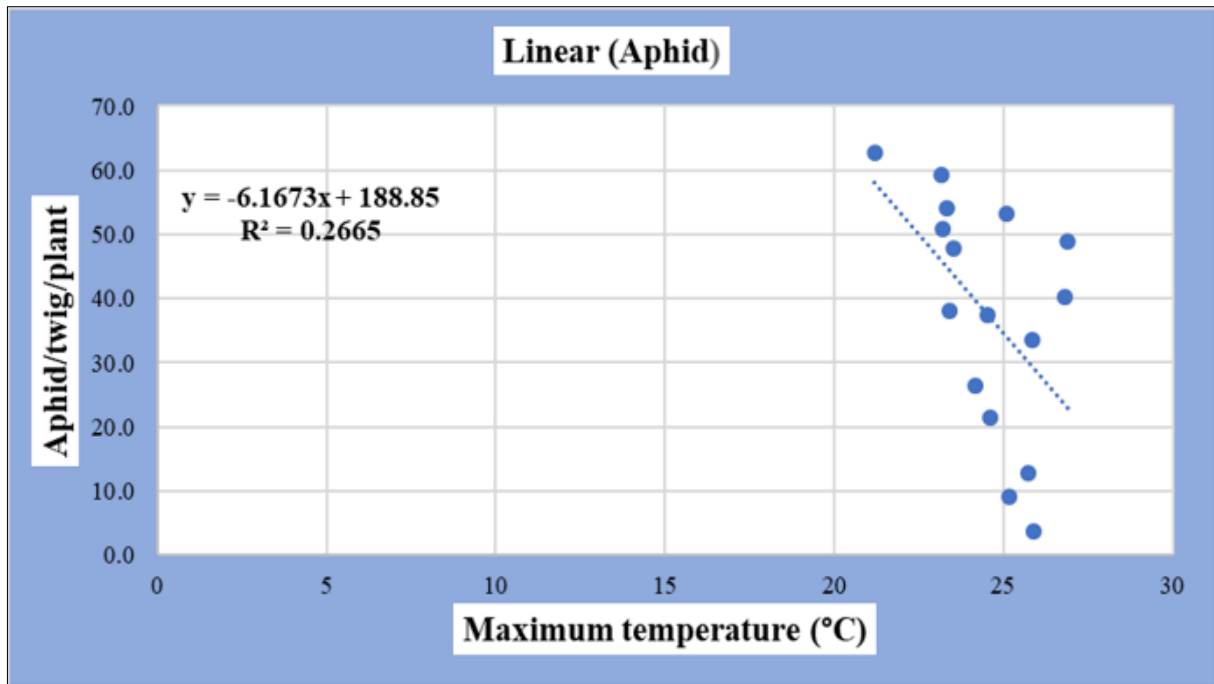


Fig. 2: Regression equation between maximum temperature and aphid (*Aphis gossypii* Glover) population

Conclusion

The seasonal incidence of aphid (*Aphis gossypii* Glover) population was recorded on buckwheat (*Fagopyrum esculentum* Moench) indicated that the population commenced from 29 Days After Sowing (DAS) i.e., last week of October (44th SMW) and persisted till second week of February (6th SMW) which ranged from 3.60 to 40.20 aphid/twig/plant. The aphid (*Aphis gossypii* Glover) population was showed non-significant correlation with among the weather factor except maximum temperature ($r = -0.516^*$), which showed significant negative correlation with aphid population.

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