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EFFECT OF THE POPULATION OF *PYRILLA PERPUSILLA* WALKER (HOMOPTERA: *LOPHOPIDAE*) ON THE GROWTH OF SORGHUM (*SORGHUM BICOLOR*)

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ABSTRACT: The field trial was laid out in the research different area of the Department of Plant Protection, Aligarh Muslim University, Aligarh, during 2000. The aim of this study was the effect of the population of *Pyrilla perpusilla* on the growth of sorghum plant. The results revealed that the eggs hatch in 8-10 days in summer and in about 3-4 weeks during November-December. The nymphs grow to maturity through five stages within 8 weeks in summer and in 5-6 months in winter. The adults live 27-52 days in the summer and 18-20 weeks in the winter. In all, 3-4 generations/year are observed. During the seedling stage, the population of *Pyrilla* was estimated as 2.53 individual/plant at an average temperature of 31.1°C and humidity 78.7% which increased to 18.05 individuals/plant at a vegetative stage at an average temperature and humidity of 30.5°C and 75%, respectively.

INTRODUTION

Sorghum, *Sorghum bicolor* (L.) Moench, is an important food and fodder crop of dryland agriculture in India. It is the third important cereal crop after rice and wheat. It is also grown as a fodder crop in some areas where fodder for cattle is a chronic problem. Most of the area under sorghum is rainfed. It requires 60-70 cm rainfall. Clay loam or loam texture soil having good water retention capacity and black cotton soil are preferred for its cultivation.

Insect pests have posed serious threat to the cultivation of sorghum. There are about 150 insect species which attack the crop and stored grain (Gahukar and Jotwani, 1980; Prem, 1987). Insects were once considered as minor pests have now become major pests and several new insects have appeared on sorghum after the introduction of high-yielding varieties (Gahukar, 1991). At present, sorghum shoot fly, *Atherigona soccata* (Rondani) (*Muscidae*: *Diptera*); sorghum stem borer, *Chilo partellus* (Swinhoe) (*Pyralidae*: *Lepidoptera*); sorghum midge, *Contarina sorghicola* (Coquillett) (*Cecidomyiidae*: *Diptera*); and sorghum earhead bug, *Calocoris angustatus* Lethiery (*Miridae*: *Hemiptera*), grey weevil, *Myllocerus* spp., and sugarcane leafhopper, *Pyrilla perpusilla* Walker are the key pests of sorghum (Gahukar, 1991).

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MATERIALS AND METHODS

Five growth stages of sorghum plant were taken into consideration: Seedling, vegetative, flowering, grain filling, and harvesting. The population was estimated by randomized sampling method. The nymphs and adults were monitored on lower four leaves, middle two nodes, and two internodes and panicles. Single factor analysis of variance was used for data analysis.

Data were collected during daily field visits under the "Effect of the population of *P. perpusilla* Walker (Homoptera: *Lophopidae*) on the growth of sorghum plant." Average per leaf populations of *P. perpusilla* eggs batches, nymphs, and adults was assessed from randomly selecting 10 leaves from sugarcane field and average egg batches per leaf were worked out by the following formula:

$$\text{Average egg batches or individuals per leaf} = \frac{\text{Total No. of egg batches or individuals on ten leaves}}{10}$$

RESULTS AND DISCUSSION

P. perpusilla Walker is a serious pest of sugarcane in India but it showed marked preference to sorghum and constitutes a good example of host crossover (Jagtap *et al*. 1985). Heavy incidence of this pest was recorded both on grains and fodder sorghum in the entire northern belt of the country. *Pyrilla* breeds throughout the year, migrating from one crop to other for fresh food. Adult females may lay 300-700 eggs in clusters on the underside of leaves during the summer and within the leaf sheaths during winter. The clusters are covered with a white fluffy material from the anal tufts of the female. As this tuft is removed, oval, pale, and white eggs are seen in longitudinal rows of 35-50 each. The eggs hatch in 8-10 days in summer and in about 3-4 weeks during November-December. The nymphs grow to maturity through five stages within 8 weeks in summer and in 5-6 months in winter. The adults live 27-52 days in the summer and 18-20 weeks in the winter. In all, 3-4 generations/year are observed.

Full-grown nymph is pale yellow, 10-15 mm long and has two white prominent feather-like filaments at the tail end of its body. The hoppers are very agile and jump around in a large number, making a faint noise. The adult, equally active, is about 20 mm long and has straw-colored body with dark patches or spots on the wings. At the front end, it has a snout-like prolongation and prominent red eyes.

Both nymphs and adults suck cell sap from underside of the leaves and the attacked leaves become pale and wilted. The honeydew excreted by the nymphs attracts sooty mold which interferes with proper functioning of the leaves and renders them unfit even as cattle feed. Light showers in May-June and long dry gaps between July and August are favorable for its multiplication. The intensity of attack is generally heavy in September, October, and November. ETL is 3-5 nymphs or adults/leaf (Sachan, 1997).

During the seedling stage, the population of *Pyrilla* was estimated as 2.53 individual/plant at an average temperature of 31.1°C and humidity 78.7% which increased to 18.05 individuals/plant at a vegetative stage at an average temperature and humidity of 30.5°C and 75%, respectively (Table 1 and Figure 1).

At flowering stage, the population of *Pyrilla* increased rapidly and 52.98 individuals/plant were observed at an average temperature and humidity of

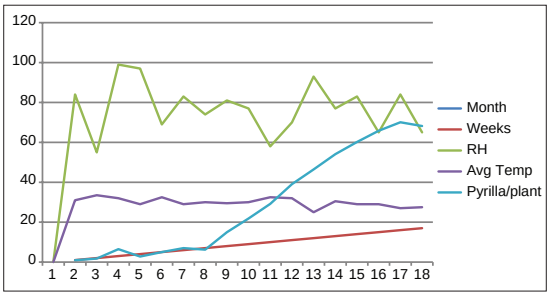

Figure 1: Population of *Pyrilla perpusilla* Walker on sorghum in relation to environmental temperature and relative humidity.

Table 1: Population of *Pyrilla perpusilla* Walker on sorghum in relation to environmental temperature and relative humidity.

Month	Weeks	RH (%)	Avg. temperature °C	Pyrilla/plant
July	1	84	31	0.91
	2	55	33.5	1.74
	3	99	32	6.46
	4	97	29	2.76
	5	69	32.5	4.99
August	6	83	29	6.99
	7	74	30	6.23
	8	81	29.5	14.97
	9	77	30	21.84
	10	58	32.5	29.16
September	11	70	32	39.06
	12	93	25	46.43
	13	77	30.5	54.07
	14	83	29	60.18
	15	65	29	65.8
October	16	84	27	70.08
	17	65	27.5	68.2

30°C and 74.5%, respectively, which further increased to 78.57 individuals/plant at grain formation stage when the temperature was found decreased to 28.3°C and relative humidity 77%. The population of *Pyrilla* did not increase significantly (80.7 individuals/plant) at harvesting stage. The average temperature and relative humidity noted at this time were 27.5°C and 66.25%, respectively.

The population build-up of *Pyrilla* depends on crop growth stages and seasonal variations of temperature, relative humidity, and rainfall (Rahman and Nath, 1940; Gupta, 1948; and Verma, 1986). Analyzed data showed that the population of *Pyrilla* was highest in the month of September at flowering and grain filling stages and subsequently did not increase significantly at harvesting time, i.e., middle of October.

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