

# Studies on the Population of the Aphid *Pentalonia nigronervosa* Coq. on Banana plants in Kerala

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The bunchy top disease of banana, caused by a virus, is transmitted by the banana aphid, *Pentalonia nigronervosa* Coq. By controlling the insect vector the chances of spread of the disease can be reduced. Knowledge on population fluctuation of the aphid with reference to climatic changes and varieties of banana will be useful in formulating effective measures of its control.

Kolkaila and Soliman (1954) observed that in Egypt, aphid activity was greatest during the winter months (December and January) with a temperature of 20–22°C, and a relative humidity of 60–70%. The alate forms appeared during the rainy period. As the temperature rose and the humidity fell during March–April, there was a reduction in the alate population. Some alate forms appeared during summer also, and they were responsible for the incidence of the disease in September–October. Varma and Capoor (1958) observed that the aphid bred throughout the year on banana, but was more common during July–February.

The present paper reports the observations made on the effects of climatic variations, varieties of banana and the disease itself on the population of the aphid on bananas.

## Materials and Methods

To study the seasonal incidence of the aphid and the effect of disease on aphid infestation, weekly counts were taken during 1956–57 from the *Palayanthodan* variety of banana in private holdings at Trivandrum. The total number of plants observed varied from 900 to 1200. The aphid population on healthy and diseased plants were recorded separately. During the period 1962–64 weekly observations were made on thirty varieties of banana to determine the relative susceptibility of varieties to aphid infestation. Suckers for the purpose were planted according to 5x6 rectangular lattice design with three replications, the spacing being six feet. Suckers of the *Nendran* variety were planted on the border rows. The number of aphids present within all the leaf-sheaths of the plants were counted and recorded. The rainfall and temperature were also noted.

## Results

### *Incidence of the banana aphid during different periods of the year*

The data on the average aphid population per plant, weekly rainfall, and weekly average temperature are shown in Fig. 1. During the summer months of March to May the temperature ranges from 80–83°F,

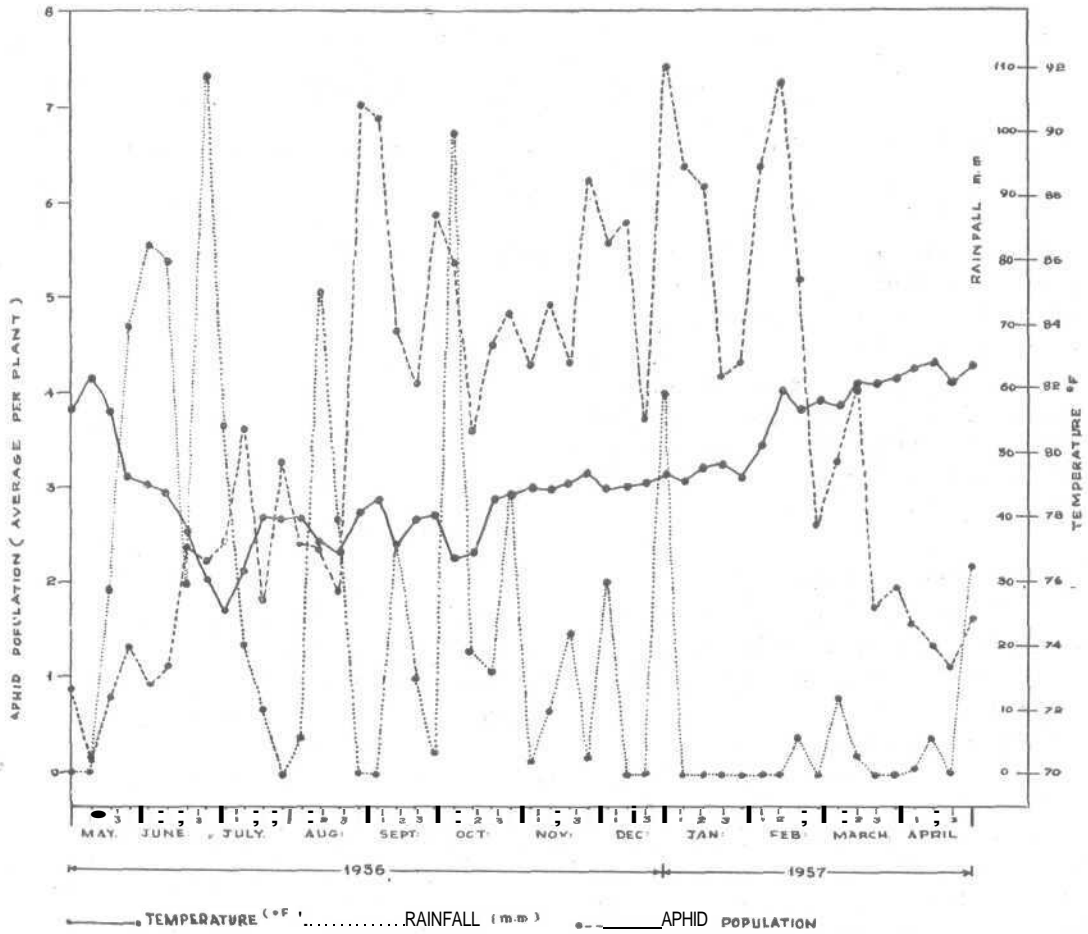


Fig. 1. Population of Banana aphid during different periods of the year.

and conditions of drought prevail. It is observed that the aphid population is at its lowest during this period. With the **pre-monsoon** showers in May the population shows an upward trend and **maintains** a moderate level till the end of the period of heavy rains, ie. till the end of August. From late August to late February, both rainfall and temperature are maintained at medium levels. The aphid population is maximum during this period. Thus it appears that moderate climatic conditions (when the rainfall and temperature are low) are **favourable** for the aphid.

*Incidence of the aphid on healthy and bunched top affected plants*

The data on the monthly average aphid population are given in Table 1.

TABLE I

Relative **intensity** of aphid population on healthy and diseased plants of the *Palayanthodan* variety of banana

Month	Average number of aphids per infested plant	
	Healthy plants	Diseased plants
June 1956	11.0	62.9
July "	23.5	38.8
August "	18.9	76.4
September "	20.6	94.1
October "	26.0	44.0
November "	35.7	49.2
December "	36.0	42.6
January 1957	28.6	37.0
February "	23.4	42.0
March "	12.0	23.7
April "	8.6	11.7

It may be seen **that** in general, the population of the aphid is greater on **bunched top affected** plants. **The** trend in

population fluctuation is more or less similar in both healthy and diseased **plants**.

*Relative susceptibility of different varieties of banana to aphid infestation*

Studies on aphid population on thirty different varieties of banana were conducted and the data were analysed statistically. The average aphid population per plant indicates that aphid infestation is comparatively high on six varieties of banana, viz., *Coonoor Nendran*\* (22.7), *Ennabaniyan* (19.4), *Boothibali* (16.6), *Peyan* (15.6), *Kostha Bontha* (13.4), and *Kali* (13.1). On other varieties of banana, the aphid population was significantly low as shown below:-

1. *Gnulipoovan*—10.9
2. *Nendran*—10.6
3. *Rasakadali*—10.0
4. *Poovan*—9.6
5. *Padalamoongil* 8.4
6. *Vannan*—7.4
7. *Patchanadan*—6.6
8. *Sirumalai*—6.4
9. *Java*—6.4
10. *Neymannan*—5.4
11. *Neyypoovan*—4.9
12. *Adakkakannan*—4.0
13. *Peykannan*—3.6
14. *Musa textilis*—3.6
15. *Annan*—2.7
16. *Monthan*—2.7
17. *Kannan*—2.5
18. *Krishnavazha*—2.3
19. *Palayanthodan*—2.3
20. *Gros michel*—2.2
21. *Koombillakannan*—2.2
22. *Kappa*—1.9
23. *Matti*—1.7
24. *Thiruvananthapuram*—1.7

\* The figures in brackets are the average population per plant.

### Summary

Climatic conditions existing during the summer months and heavy rainfall are unfavourable for the banana aphid. The aphid infestation is high during August to February when the temperature and rainfall are moderate. Aphid population is higher on bunchy top affected banana plants than on healthy plants. Six varieties, viz , *Coonoor Nendran*, *Ennabaniyan*, *Boothibali*, *Peyan*, *Kostha Bontha*, and *Kali* are more susceptible to infestation by the aphid than the other 24 varieties studied.

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