RESEARCH NOTE

EFFECT OF ABIOTIC FACTORS ON POPULATION OF OKRA APHID

Tariq Mahmood, Khalid Mahmood Khokhar, Muhammad Banaras and Mohammad Ashraf*

Key Words: Abelmoschus esculentus; Aphis; Population Dynamics; Relative Humidity; Rainfall; Temperature; Pakistan.

INTRODUCTION

Okra, Abelmoschus esculentus L. is a valuable and nutritive vegetable crop and grown almost all over Pakistan. It is attacked by a number of insect pests particularly jassid, Amrasca devastans (Distant), aphid, Aphis gossypii Glov. and shoot and fruit borer, Earias spp. (Mehan, 1985; Dadheech et al., 1977; Kushwaha, 1983). Among sucking pests, aphid, A. gossypii is a serious pest of this crop throughout the growth season of okra crop in India (Srinivasan and Krishnakumar, 1983). This has been reported as a serious pest in Sudan too (Anonymous, 1978). It damages the plant by sucking the sap and also acts as a vector for virus transmission (Wangboonkong, 1981).

Keeping in view the seriousness of this pest in other countries, it was considered desirable to study the seasonal occurrence and effect of abiotic factors including maximum and minimum temperatures, relative humidity (%) and rainfall on the aphid density under existing conditions.

METHODOLOGY

A local cultivar of okra, ‘Pusa Green’, was sown on April 4, 1986 and on April 23, 1987 at National Agricultural Research Centre, Islamabad. Plant to plant and row to row distances were 25 and 60 cm, respectively. There were three replications of 12 rows each. The length of each row was 5m. The aphids present on top, middle and lower parts of the plant were randomly counted. Number of aphids per 63 randomly selected leaves per experiment were counted and transformed into per leaf population.

RESULTS AND DISCUSSION

The okra aphid activity started in the middle of May with a serious activity from June 3 to June 13. In next year, the serious activity started 20 days earlier and remained as serious till June 13. Population was low from June 23 to September 11 in both the years of study (Figure 1). In the first year of study, the data were not recorded after September 11, due to heavy infestation of leaf hopper, A. devastans which resulted in complete destruction of okra leaves. In the second year of study, an out break of aphid was found on September 21 and remained

* Vegetable Crops Research Programme, National Agricultural Research Centre, Islamabad.
very serious till October 1 followed by a decline. The highest number of aphids per leaf was found as 12.78 and 28.29 on June 13, 1986 and September 21, 1987.

Under existing conditions, the okra aphid did not remain serious problem throughout the growth period of okra crop while Srinivasan and Krishnakumar (1983) and Anonymous (1978) reported the same as a serious pest throughout the growth season of this crop. This difference might be due to different environmental conditions as the studies were conducted in other countries. For the effective control of this pest on okra, a careful scouting at regular intervals throughout the crop growth is essential to determine whether the insecticidal spray is needed or not.

**Effect of Abiotic Factors on the Density of Aphid**

The data on the abiotic factors affecting the seasonal occurrence of aphid, A. gossypii revealed that the mean maximum and mean minimum temperature has a positive but non-significant correlation with the density variation of aphid in both years of study (Table 1). However, the increase in rainfall and relative humidity decreased the number of aphids per leaf non-significantly. The
Table 1. Effect of abiotic factors on the density variation of okra aphid at National Agricultural Research Centre, Islamabad during 1986 and 1987.

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<tbody>
<tr>
<td>Maximum temperature (°C)</td>
<td>27.90-41.60</td>
<td>27.90-40.70</td>
<td>0.323NS</td>
<td>0.119NS</td>
<td>Y = -9.63 + 0.36x Y = -3.517 + 0.23x</td>
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<tr>
<td>Minimum temperature (°C)</td>
<td>6.30-26.80</td>
<td>12.10-25.40</td>
<td>0.085NS</td>
<td>0.011NS</td>
<td>Y = 1.265 + 0.06x Y = 3.942 + 0.02x</td>
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<td>Relative humidity (%)</td>
<td>42.00-86.80</td>
<td>43.50-83.70</td>
<td>-0.327NS</td>
<td>-0.258NS</td>
<td>Y = 9.236 - 0.10x Y = 5.769 - 0.04x</td>
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<td>Rainfall (mm)</td>
<td>0.20-10.65</td>
<td>3.90-148.00</td>
<td>-0.153NS</td>
<td>-0.230NS</td>
<td>Y = 3.027 - 0.02x Y = 13.345 - 0.15x</td>
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NS = Non-significant at P ≤ 0.05

above mentioned abiotic factors had no significant contribution toward increasing or decreasing the aphid density of okra. Araujo and Sales (1985) studied the effect of climate on aphid, A. gossypii on cotton in Brazil and found that the population dynamic were not affected significantly by the minimum or maximum or mean temperature, relative humidity and rainfall.

LITERATURE CITED


